The RUBBER AGE

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LATE NEWS of the Industry

Tire Prices Raised from 2½% to 5%, As Discounts to Dealers Are Advanced

NEW list prices on automobile tires went into effect on November 1, the date on which all trade contracts for the next twelve months become effective, following the announcement of an increase in price by all the major companies in the industry. The lists show advances ranging from 2½% to 5% over prevailing price levels. It is understood that the new schedules will carry a guarantee until May 15 and will provide a stable price level for spring-dating business.

Although the retail price list is being advanced, the tire companies themselves are not benefiting from the new schedules. This is due to the fact that, simultaneous with the increased retail prices, the tire companies are increasing dealer discounts to approximately 25% from the current rate of approximately 21¼%.

Dealers, however, will benefit substantially from the changes to go into effect November 1. The change was decided upon to encourage the dealer end of the business and to stimulate the large replacement business anticipated in 1931. Discounts to fleet owners or national accounts will revert back to the schedule in effect prior to the recent "trade war" which was terminated about the middle of September.

The importance of mail order competition has not been overlooked under the new list schedules, as it is understood that one or more important producers will continue to feature lines listed to sell at catalogue prices after providing a fair margin of profit for the retailer.

According to newspaper reports, F. A. Seiberling, president of the Seiberling Rubber Company, has denied flatly that his company had any share in the price advance. No statement was made by the Firestone Tire & Rubber Company, but an official of the Goodyear Tire & Rubber Company was quoted as saying, "Goodyear regards the move as a constructive one." Sales officials of other Akron firms were reported as declaring that the revisions were precipitated by the B. F. Goodrich Company. The Goodrich organization has issued the following statement:

"Recent increases in the prices of automobile tires and tubes effective throughout the industry, only slightly affected the B. F. Goodrich Rubber Company.

"The advance in prices in some units and the decrease in others approximately balanced, Goodrich sales officials stated. Goodrich prices will remain as high, and in some cases slightly higher than those of other major companies. The company was not in sympathy with the general reduction of list prices of tires and tubes last June, believing the change without economic justification, and for that reason generally continued its prices on a somewhat higher basis than other companies.

"Goodrich officials believe the newest change, effective November 1, is of constructive value to the rubber industry generally."

U. S. to Double Samson Tire Output; Details of Merger Plan Are Issued

WITH plans completed for the merger of the Samson Tire & Rubber Company with the United States Rubber Company, announcement has been made that the Los Angeles plant of the former will practically double its output, bringing daily production up to 10,000 tires and 20,000 tubes. Actual operations of the Samson plant will be carried on under the present name, and Adolph Schleicher, president and general manager, will continue in that capacity. His brother, B. F. Schleicher, will be executive vice-president.

Terms of the proposed consolidation have been given in a letter to stockholders by President Schleicher. The plan entails an exchange of stock of the present Samson Tire & Rubber Company for shares in a new company to be known as the Samson Corporation. The United States Rubber Company will then purchase from this new company 120,000 shares of A common stock, which will have the voting rights, and 50,000 shares of B common stock for a stated sum of $600,000.

The Samson Tire & Rubber Company now has outstanding 165,010 shares of no-par common stock. The new Samson Corporation will be organized under the laws of Delaware and will have the following capital structure: 200,000 shares of 6 per cent non-cumulative $10 par value preferred stock, 200,000 shares of A common stock of no par value, and 200,000 shares of B common stock of no par value.

Upon the organization of the new corporation, it is proposed that the common stockholders of the Samson Tire & Rubber Company exchange their shares for an equal number of shares of the preferred stock of the new company,

plus three-tenths of one share of the B common stock of the new company for each share of the common stock of Samson Tire & Rubber Company.

"The consolidation," President Schleicher declared, "adds to the Los Angeles industrial fabric the additional volume of business, increased payrolls and capital investment of one of the largest rubber manufacturers in existence. This means another big step forward in the prominence of Los Angeles as a tire manufacturing centre."

The plan for the United States Rubber Company to purchase control will go into effect, provided the holders of not less than 35 per cent of the present outstanding Samson common stock shall have exchanged or deposited for exchange their shares on or before December 31, next. After that date, if in accordance with law, any exchange of Samson stock will be on the basis of one share of Samson common for one share of the new preferred without the additional B common stock, unless otherwise determined by the United States Rubber Company.

Dividends on the preferred stock of the new corporation at a rate not exceeding 5 per cent per annum will be guaranteed for five years, subject to previous retirement by the United States Rubber Company. This guarantee applies only to the preferred stock issued on the organization of the new corporation not exceeding 165,010 shares, and any amount paid under such guarantee shall be repaid to the guarantor before any dividends shall be declared in any year in excess of 5 per cent per annum on the preferred stock.

The new corporation will purchase from Samson Tire & Rubber Corporation 60,000 shares of its authorized but unissued convertible preferred stock for the sum of $600,000, the proceeds of which may be used to retire current bank obligations of the Samson Company.

The 50,000 shares of B common of the new corporation to be issued as a part of the purchase by or on account of the United States Rubber Company of stock of the new corporation will be held for the purpose of a profit-sharing plan hereafter to be worked out for the benefit of Samson Tire employees.

Copies of the company's balance sheet as of July 31, last, which accompanied the letters, showed current assets of $1,919,836.97, of which inventories amoounted to $898,172.37; accounts receivable less reserves, $757,916.74; trade acceptances receivable, $175,183.51; cash surrender value of life-insurance policies, $14,300, and cash in bank and on hand, $74,264.35. Current liabilities totaled $1,295,901.79.

The surplus account showed a loss of $81,036.27 for the seven months ended July 31, last, which, together with deduction of $2,019.15 for preferred dividends, reduced the surplus from $221,134.29 on December 31, last, to $138,078.87, as of July 31, last. Total assets were listed as $5,089,992.23.

National Tire Dealers' Association Discusses New Competition at Chicago

WITH several hundred members in attendance, the eleventh anniversary convention of the National Tire Dealers' Association was held at the Hotel Sherman, Chicago, Ill., on November 4 and 5, with special sessions for the Truck and Bus Tire Division on November 3, and for the United Tire Stores Corporation on November 6. Discussion of the gasoline and oil companies' entrance into the retail tire business on the morning of November 4 was the main feature of the convention.

Among the featured speakers at the convention were Samuel Woolner, Jr., president of the Kelly-Springfield Tire Company and of the Rubber Manufacturers Association; F. W. Lovejoy, of the Vacuum Oil Company; and William O'Neil, president of the General Tire & Rubber Company. Mr. O'Neil spoke on the afternoon of November 3 before the session of the Truck and Bus Tire Division on "Looking Ahead in the Tire Business."

"In two years," Mr. O'Neil declared, "we will forget that there ever had been a panic. Next spring, I believe, will be a wonderful season for business and I predict that there will be a demand for more tires than will be available. American manufacturers will not have enough tires to deliver next spring to meet the demand. The American motorist has been getting by this year on his spare tire. Only one and one-half tires per registered car have been sold this year, which shows that the spare tire has been doing the trick."

Harvey S. Firestone, president of the Firestone Tire & Rubber Company, was an unscheduled speaker on the afternoon of November 5. He expressed confidence that the tire industry would have the largest business in its history in 1931 and declared his hope that the prices of tires would be stabilized. Mr. Firestone typified the mail order house and chain store which give no service as menaces to the industry.

"The great problem today is the readjustment taking place in the field of merchandising and distribution," Mr. Firestone continued. "In the tire industry this has been intensified by the addition of service in its distributing system. Many people today think they can buy cheaper from the mail order house and the chain store, and it is up to the independent store and dealer to prove to the public that this is not a fact. I am sure if they give thought, energy and determination to serving the public as well or better than the chain store or mail order house they will succeed in correcting this impression."

Mr. Firestone described how his company has established 400 one-stop service stores or "department stores for the car owner" in cooperation with dealers, which includes service such as lubrication, batteries, brake lining, gasoline, oil and accessories.

"Our program for giving standard service to the car owner," he said, "naturally has necessitated a great outlay of capital. This prevented many progressive dealers from making this investment, or assuming a large lease obligation. Therefore, in these cases it became necessary that we go into partnership with this dealer and help him carry the load as far as we could, and in each case a new corporation was formed. It was necessary for us to have financial control, of which the dealer was the head. It was optional for the dealer to use his name or incorporate under or use the 'Firestone Service Store, Inc.' name. In a few cases where we did not have a dealer with whom we were willing, or could go into partnership, we established a store and set out to find a man who could, if possible, take a financial interest and be at the head of the company. Through this method, over 400 of these one-stop service stores have been established."

At the conclusion of the convention, Martin J. Barry of Baltimore, was elected president of the association for the ensuing year. A. L. Glick of Pittsburgh, was elected vice-president and Norval P. Trimborn of Chicago, secretary.

The trade exhibits shown on the mezzanine floor of the hotel and in the exhibit hall were of unusual interest. Among the exhibitors were the Polson Rubber Company, Martin Rubber Company, A-R Products Corporation, Dill Manufacturing Company, National Erie Company, James C. Heintz & Company, and many other leading suppliers to tire dealers and repairmen.

National Business Survey Conference Finds Tire Stocks Lowest in Two Years

THE National Business Survey Conference, through its chairman, Julius H. Barnes, issued on October 27 a summary of factual reports on important lines of business and industry without attempt at comment or interpretation. For rubber manufacturers, the conference report included 75 per cent estimates of September casing production and inventory, received from the Rubber Manufacturers Association, Inc.

Raised to a 100 per cent basis, these figures show that domestic output of all pneumatic casings in September totaled 3,463,260 units, a decline of 21.5 per cent from August. With the single exception of December, 1929, this is the lowest month's output by the American industry since July, 1924.

Inventories at the end of September, according to the survey figures, raised to represent 100 per cent of the industry, were 10,254,192 casings, a decline of 11.2 per cent below August. This is the lowest figure for stocks of casings in the hands of manufacturers since September 30, 1928.

For the first nine months of 1930, production of pneumatic casings has totaled 44,582,903 units, a decline of 27.6 per cent from the output of 61,524,125 casings in the first three quarters of 1929. Current trade advices from manufacturing centers indicate that October tire production was even less than that of September, if not below the record low of last December.

The tire price index for September was 52, the same as for July and August.

General Tire & Rubber Company Will Make No More Curtailments This Year

"PRODUCTION operations of the General Tire & Rubber Company will continue at the same rate as at present during November and December and will be increased in January," it was announced late last month by W. O'Neil, president of the company.

"At no time this year has our production dropped more than 15 per cent from the peak," President O'Neil said. "Our company made a gain in business in September over September, 1929, both in units and in dollars and cents.

"Our tire output this year, in pounds of rubber consumed, will be greater than it was last year. Due to lower prices of crude rubber and tires, however, our sales income will be less in dollars and cents, but not more than 12½ per cent less than last year.

"The average General tire workman has lost only three-fourths of a day's work a week and no men have been laid off. We are operating with a somewhat smaller payroll as some of our workers have gone into other lines of work and these were not replaced, but none were laid off."

Mr. O'Neil's statement was made simultaneously with the action by the directors of the General Tire & Rubber Company in declaring the company's regular quarterly dividend of $1 on the common stock, which is equivalent to 16 per cent yearly return on the par value of the stock. This dividend was paid on November 1 to stockholders of record as of October 20.

At no time since the organization of the company has it failed to pay regularly dividends on both classes of its stock, a record that is held by none other of the larger rubber companies. Company earnings during the first six months of the present fiscal year were sufficient to cover dividend requirements for the entire year on both classes of the stock, officials announced.

"HARRY" HOAG NO LONGER WITH "INDIA RUBBER WORLD"

THE many friends of L. H. (Harry) Hoag in the rubber industry will learn with regret that he has resigned as advertising manager of the *India Rubber World*, effective October 15. His wife, Mrs. E. M. Hoag, who has also been connected with the publication, resigned at the same time.

Mr. Hoag began his association with the *India Rubber World* in 1918 succeeding the late E. A. Pfaff. The progressiveness and steady growth of the paper during the last decade can be attributed largely to the efforts of Mr. Hoag, who has won for himself a position of great respect among leading suppliers of materials and equipment as well as among factory executives throughout the rubber industry.

Mrs. Hoag has been with the paper a considerable period, starting as office assistant and later becoming secretary and general assistant to Henry C. Pearson, former publisher of the *World*, with complete charge of the office, bookkeeping, circulation and advertising departments.

THE RUBBER AGE joins their many friends in wishing "Harry" and Mrs. Hoag sincere good wishes and success in whatever may be their future endeavors.

October Rubber Consumption Figured At 22,000 Tons by Exchange Members

CONSUMPTION of crude rubber during October will total approximately 22,000 long tons, according to estimates in the rubber trade, which would compare with 25,288 tons consumed during September, and with 34,455 tons used by American manufacturers during October, 1929. This estimate was issued in an announcement by the Rubber Exchange of New York.

As a general rule, rubber consumption during the October of any year shows little if any improvement over the previous month. This year, tire factories at Akron and in New England cities are operating at reduced schedules to avoid burdensome inventories prior to the usual wide resumption of production following the turn of the year.

Consumption of 22,000 tons during October will bring the total for the ten months to 320,810 long tons, against 416,403 tons for the same period last year and 365,488 tons in 1928, based on the Rubber Manufacturers' Association quarterly and monthly statistics. This would indicate that 1930 consumption for the full year will be at least 100,000 tons under the figure for 1929.

Goodrich Will Sell Radio Sets

The B. F. Goodrich Company, through its retail chain subsidiary, Goodrich-Silvertown, Inc., is starting the sale of a small radio set in its company-owned stores. A five-tube unit screen-grid with dynamic speaker, it is marketed under the trade name "Mantola" because it can be placed on the average mantel and it sells for $49.50 complete. Newspaper reports state that specifications for the set have been furnished by Goodrich to independent manufacturers that might wish to bid on them, as Goodrich does not intend to manufacture the sets.

(Other news of the industry will be found on pages 149-155)

DEALERS' STOCKS OF TIRES BY STATES

October 1, 1930

	Total Casings			High Pressure			Inner Tubes		
	No. of Dealers Reporting	*No. of Tires on Hand*	*Ave. No. per Dealer*	*No. of Dealers Reporting*	*No. of Tires on Hand*		*No. of Dealers Reporting*	*No. of Tubes on Hand*	*Ave. No. per Dealer*
New England									
Maine	429	17,113	39.9	328	3,583		422	24,677	58.5
N. H.	217	11,087	51.1	165	1,973		215	15,338	71.3
Vt.	195	11,462	58.8	144	2,144		196	16,515	84.3
Mass.	751	46,764	62.3	513	8,089		767	65,517	85.4
R. I.	145	10,397	71.7	100	1,496		151	15,403	102.0
Conn.	334	23,002	68.9	238	3,587		336	30,665	91.3
Total	2,071	119,825	57.9	1,488	20,872		2,087	168,115	80.6
Middle Atlantic									
N. Y.	2,135	182,480	85.5	1,536	26,302		2,125	258,663	121.7
N. J.	695	41,082	59.1	469	5,949		699	62,229	89.0
Penn.	2,726	168,128	61.7	1,878	25,465		2,733	216,945	79.4
Total	5,556	391,690	70.5	3,883	57,716		5,557	537,837	96.8
East North Central									
Ohio	1,750	97,409	55.7	1,261	16,892		1,760	134,717	76.5
Ind.	962	62,595	65.1	734	10,279		976	91,735	94.0
Ill.	1,603	106,268	66.3	1,235	17,343		1,610	145,810	90.6
Mich.	1,249	64,915	52.0	911	10,430		1,250	98,559	78.8
Wis.	1,116	65,229	58.4	878	12,068		1,107	92,469	83.5
Total	6,680	396,416	59.3	5,019	67,012		6,703	563,290	84.0
West North Central									
Minn.	884	54,373	61.5	710	11,858		880	78,806	89.6
Iowa	972	54,914	56.5	783	11,187		960	78,677	82.0
Mo.	912	56,553	62.0	713	10,363		912	82,725	90.7
N. D.	465	19,165	41.2	350	4,125		465	30,897	66.4
S. D.	382	14,645	38.3	311	3,156		386	23,586	61.1
Neb.	521	29,509	56.6	430	5,448		522	46,306	88.7
Kans.	810	48,681	60.1	685	10,574		823	75,637	91.9
Total	4,946	277,840	56.2	3,982	56,711		4,948	416,634	84.2
South Atlantic									
Del.	55	6,225	113.2	35	1,347		53	7,123	134.4
Md.	423	30,016	71.0	282	6,371		424	44,180	104.2
Dist. Col.	54	7,152	132.4	37	596		54	8,716	161.4
Va.	831	35,568	42.8	577	6,805		836	51,985	62.2
W. Va.	483	21,875	45.3	324	3,509		481	31,317	65.1
N. C.	540	31,941	59.2	381	5,832		547	43,711	79.9
S. C.	314	12,805	40.8	222	2,494		315	24,747	78.6
Ga.	449	27,009	60.2	351	6,177		460	47,037	102.3
Fla.	321	29,907	93.2	248	4,850		318	37,132	116.8
Total	3,470	202,498	58.4	2,457	37,981		3,488	295,948	84.8
East South Central									
Ky.	416	19,969	48.0	305	3,539		412	31,927	77.5
Tenn.	357	28,896	80.9	269	5,550		362	41,549	114.8
Ala.	360	25,746	71.5	266	3,287		367	37,671	102.6
Miss.	381	17,643	46.3	278	3,377		386	28,968	75.0
Total	1,514	92,254	60.9	1,118	15,753		1,527	140,115	91.8
West South Central									
Ark.	354	18,422	52.0	263	3,020		358	27,804	77.7
La.	286	19,497	68.2	222	4,167		280	30,667	109.5
Okla.	489	39,892	81.6	389	5,776		496	54,803	110.5
Tex.	1,530	92,036	60.2	1,234	19,128		1,553	155,025	99.8
Total	2,659	169,847	63.9	2,108	32,091		2,687	268,299	99.9
Mountain									
Mont.	303	17,053	56.3	234	2,441		297	24,705	83.2
Idaho	232	12,073	52.0	175	2,062		234	15,640	66.8
Wyo.	117	8,842	75.6	87	906		117	10,721	91.6
Colo.	399	33,318	83.5	311	4,568		407	47,313	116.2
N. M.	145	7,105	49.0	103	935		148	11,672	78.9
Ariz.	189	14,945	79.1	143	2,036		188	21,719	115.5
Utah	198	12,751	64.4	143	1,898		201	16,092	80.1
Nev.	55	2,865	52.1	49	582		54	4,295	79.5
Total	1,638	108,952	66.5	1,245	15,428		1,646	152,157	92.4
Pacific									
Wash.	687	35,057	51.0	514	6,426		688	48,256	70.1
Ore.	390	24,218	62.1	314	4,158		379	30,611	80.8
Calif.	1,792	138,958	77.5	1,387	26,143		1,794	187,021	104.2
Total	2,869	198,233	69.1	2,215	36,727		2,861	265,888	92.9
Unallocated	119	8,173	68.7	69	1,469		120	11,348	94.6
Total U. S.	31,522	1,965,728	62.4	23,584	341,760		31,624	2,819,631	89.2

NUMBER OF MAKES OF TIRES HANDLED

	Oct. 1, 1928		*Oct. 1, 1929*		*Oct. 1, 1930*	
No. of Makes:	*No. of Dealers*	*Per Cent of Total*	*No. of Dealers*	*Per Cent of Total*	*No. of Dealers*	*Per Cent of Total*
One	13,864	53.93	15,642	64.15	20,446	70.26
Two	8,662	33.70	6,676	27.38	6,843	23.51
Three	2,171	8.45	1,443	5.92	1,245	4.28
Four	704	2.74	410	1.68	346	1.19
Five	204	0.79	129	0.53	150	0.52
Six	102	0.39	82	0.34	72	0.24
Total	25,707	100.00	24,382	100.00	29,102	100.00

Tire Dealers Su
Sharp Declin

The Average Tire Dealer He 24
on October 1, According urve

THAT the stock of tires in the hands of the average dealer in the United States has been sharply reduced from this time a year ago is shown by the final statistics compiled by the Department of Commerce from the survey undertaken by the Rubber Division of the Bureau of Foreign and Domestic Commerce, although the fact that more dealers reported this year made the grand total for the country somewhat higher. The previous increase in dealers carrying more than 200 casings has been abruptly halted, but the trend toward concentration on the tires of a single manufacturer continues, more than 70 per cent of the dealers reporting that they handle but a single make of tires.

In a preliminary report, issued by the Department of Commerce on October 15, it was indicated that the average dealer was holding 60.4 casings and 87.2 inner tubes. With added information from nearly 8,000 more dealers, both of these figures showed the usual increase in the final report which revealed that the average dealer had 62.4 casings and 89.2 inner tubes as of October 1. The final report for the same date last year showed the average pneumatic tire and tube stock at 68.4 and 103.4, respectively, indicating an 8.8 per cent loss for the former and a 13.7 per cent drop for the latter.

The decrease in the average dealer's stock this year reflects the current business depression, which has caused retailers as well as manufacturers to curtail their inventories and to carry on hand hardly more goods than necessary for immediate needs. The grand total figure for the country, however, increased from 1,739,043 casings last year to 1,965,728 this year, due to the fact that 31,522 dealers answered the questionnaires as against only 25,417 in 1929.

More Dealers in Small-Stock Class

An analysis by volume groups has been prepared of the reports from dealers having stocks of casings, and a comparison made to the survey of October 1, 1929. This year a greater percentage of reports fell into the classes of dealers having less than 50 casings in stock, a smaller percentage of reports falling into the classes of dealers having more than 50 casings in stock.

The gains made by balloon casings and the decline on the part of high pressure casings have continued, and the Department of Commerce this year has continued its new policy of segregating the dealers carrying high pressure casings. These dealers, 23,584 in number this year as against 20,045 last year, report stocks of only 341,760 high pressure casings as compared with 459,001 a year ago. The average inventory of high pressure casings per dealer has, therefore, been cut from 22.9 last year to only 14.5 in 1930. More dealers carrying solid and cushion tires reported this year, causing a gain in the total number of these

's Survey Shows n Inventories

24 Casings and 89.2 Tubes
urvey of Rubber Division

tires on hand, but the average per dealer declined. With 1,443 dealers answering that part of the questionnaire, it was shown that the present average is 22.7 solid tires per dealer as against 24.2 in 1929.

How consistently the tendency toward concentration of sales efforts by dealers is progressing was proven by the fact that 70.26 per cent of all dealers reported that they handled only one make of tire as compared with 68.3 per cent on April 1 of this year and with 64.15 per cent on October 1, 1929. Of the dealers with more than a single line, 23.51 per cent handle two makes, 4.28 per cent three makes, and only 1.95 per cent handle four or more makes. This trend to concentration is also due in part to the consolidation of certain manufacturers and the elimination of other weaker ones.

States With Highest Average Stocks

The District of Columbia and Delaware replaced Oklahoma and Louisiana in point of the largest average dealer stocks in the country. District of Columbia dealers reported average stocks of 132.4 casings and 161.4 inner tubes, while 55 Delaware dealers reported an average of 113.2 casings and 134.4 tubes. Close behind in casing stocks were Florida with an average of 93.2 and New York with 85.5. Florida dealers have always been among the leaders in amount of stocks, having been highest in 1928 and fourth in 1929, but this is the first time in recent years that New York State dealers have shown such a high average of casing inventories.

Tire dealers were questioned as to whether they sold automobiles, gasoline or batteries, but the previous questions as to whether they maintained vulcanizing equipment or made automobile repairs were not asked. The returns showed that the percentage of tire dealers selling automobiles decreased from October 1, 1929, while the percentages of dealers selling gasoline and batteries increased in the same period. A special analysis of dealers handling automobiles shows that less than 30 per cent of the tire dealers handling only one make of tire sell autos, while over 50 per cent of the dealers handling more than one make also sell automobiles.

In the present survey, seven reports were received from chain store organizations, showing total stocks of 473,070 casings and 424,801 inner tubes on October 1, 1930. These figures do not include stocks held by the two principal mail order houses, nor stocks in stores operated by any tire manufacturing companies. No comparable statistics are available for previous surveys, but on October 1, 1928, the two principal mail order houses and one of the firms included in the present tabulation reported a total of 615,508 casings and 730,889 inner tubes on hand.

DEALERS' STOCKS OF AUTOMOBILE TIRES

	October 1, 1929			October 1, 1930		
	Number	Dealers Reporting	Ave. per Dealer	Number	Dealers Reporting	Ave. per Dealer
Total casings	1,739,043	25,417	68.4	1,965,728	31,522	62.4
High pressure casings	459,001	20,045	22.9	341,760	23,584	14.5
Inner tubes	2,592,355	25,079	103.4	2,819,631	31,624	89.2
Solids, etc.	24,940	1,032	24.2	32,775	1,443	22.7

AVERAGE STOCKS PER DEALER

	1924	1925	1926	1927	1928	1929	1930
Total casings	53.6	56.6	49.9	57.6	64.8	68.4	62.4
Balloon casings	16.3	17.5	19.8	30.7	44.0	(a)	(a)
High pressure casings	(a)	(a)	(a)	(a)	(a)	22.9	14.5
Inner tubes	79.9	99.1	93.8	103.1	107.4	103.4	89.2
Solids, etc.	(b)	25.0	23.9	26.1	23.4	24.2	22.7

(a) Number of dealers not tabulated separately on survey indicated.
(b) Comparable statistics for 1924 not available.

DEALERS CLASSIFIED BY VOLUME OF STOCK

	October 1, 1929			October 1, 1930		
Casings:	Number of Dealers	Per Cent of Total Dealers	Number of Casings	Number of Dealers	Per Cent of Total Dealers	Number of Casings
Less than 10	4,417	17.38	23,141	6,251	19.83	31,636
10-24	7,398	29.11	123,835	8,883	28.18	141,860
25-49	5,815	22.88	214,444	7,361	23.35	256,121
50-99	4,211	16.57	300,878	4,953	15.71	339,175
100-199	2,075	8.16	291,507	2,369	7.52	325,441
200-299	612	2.41	151,212	685	2.17	163,734
300-399	287	1.13	99,390	343	1.09	115,787
400-999	472	1.86	284,645	535	1.70	319,777
1,000 and Over	130	0.50	249,991	142	0.45	272,197
Total	25,417	100.00	1,739,043	31,522	100.00	1,965,728

SUMMARY OF DEALERS' BUSINESS

	October 1, 1929		October 1, 1930	
	Number	Per Cent of Total	Number	Per Cent of Total
Total reports received	26,057	100.0	32,611	100.0
Sell automobiles	10,203	39.2	11,379	34.9
Sell gasoline	19,318	74.1	24,294	74.5
Sell batteries	15,550	59.7	21,296	65.3
Automotive repairs	12,642	48.5	(a)	
Vulcanizing equipment	3,589	13.8	(a)	

(a) Question not asked on survey indicated.

DEALERS' STOCKS OF SOLID AND CUSHION TIRES

States	No. of Dealers	No. on Hand	States	No. of Dealers	No. on Hand
Alabama	19	269	Nevada	2	21
Arizona	10	82	New Hampshire	7	197
Arkansas	12	147	New Jersey	28	1,022
California	89	1,609	New Mexico	3	20
Colorado	23	780	New York	119	4,279
Connecticut	19	234	North Carolina	21	267
Delaware	2	16	North Dakota	20	698
D. C.	3	144	Ohio	81	939
Florida	11	273	Oklahoma	25	857
Georgia	18	283	Oregon	18	670
Idaho	8	28	Pennsylvania	134	2,463
Illinois	72	1,839	Rhode Island	12	151
Indiana	42	335	South Carolina	9	212
Iowa	38	598	South Dakota	20	554
Kansas	28	455	Tennessee	21	363
Kentucky	24	537	Texas	60	2,499
Louisiana	16	2,150	Utah	3	20
Maine	15	384	Vermont	20	99
Maryland	16	291	Virginia	42	387
Massachusetts	26	544	Washington	44	591
Michigan	52	1,176	West Virginia	29	373
Minnesota	45	948	Wisconsin	33	548
Mississippi	30	946	Wyoming	6	160
Missouri	36	621	Unallocated	2	15
Montana	8	190			
Nebraska	22	491	Total	1,443	32,775

The RELATION of S

Problems of the Design Engineer in Planning Machi to the Safety of the Workers—Safe des

By M. ARYA
Design Engineer, Good

USING the term in its broadest sense, "design" has no doubt always been influenced by the elements of "safety." But, while the term design is fairly constant, safety is an elusive bird, that changes color, plumage and identity according to the relative value of the factors involved, and which are different in every country, in every age, and in every one of the almost infinite ramifications of the designer's art.

In ancient and medieval times, human life was considered of no particular value. The operators of a tread mill, in the time of "King Tut" were not valued nearly as highly as the mill on which they toiled. The same was true of the oarsmen, chained to the war boats of Greece, Persia and ancient Rome, and the soldiers who operated the catapults and siege rams at the fall of Troy. Designers, in those days, were more concerned with the safety and efficiency of the device than of its operators. As a matter of fact, this is true to considerable extent, in some countries even today, and we might be justified in stating that the degrees of the civilization of any country can be gauged according to the value they place on human life.

As there are many avenues of design necessary to the comfort and progress of man, there are likewise many viewpoints to the element of safety. In the design of a building, widely different precautions must be taken than are necessary in the design of a machine. The architect studies wind stresses, snow loads and various other factors which seldom affect a mechanical unit, and the machine designer, on the other hand, considers safety from standpoints not involved in a building. The same thing is true in the design of materials, such as the inner construction and walls of a tire, a fire escape, a motor boat, or any other of the many avenues of design. In a machine there is often the safety of the material being handled to consider. This is a factor that becomes more and more important with modern high speed. In modern newspaper plants, the stock must travel at a great speed through hundreds of feet of machinery.

Very little pure freedom of design, these high pressure days, is left in the hands of the designer, and a brief example will show that this is necessary. Perhaps you live in an apartment. If so, you probably can view a fire escape from some of your windows. That unsightly, but highly desirable safeguard, was not designed according to the fancy of the contractor who got the job. Everything about it was made according to predetermined articles of the Building and Safety Code, the size and spacing of the rivets that hold it together, the bolts that fasten it to the building, the size, number and spacing of the structural angles that compose its hand rails, the area of its landings and the relation of the risers to the treads in its stairways. If this were not the case, every firm who bid on that fire escape would present a design according to his own ideas of safety; the contractor would probably accept the lowest in price, and the fire escape, instead of being a safeguard, might be a misleading death trap.

Freedom in Design is Restricted

Designers today are necessarily, to a considerable extent, inventors; and since, as President Hoover recently pointed out, "In the creation of new inventions, processes and methods lies our present and future greatness," it is therefore reasonable to assume that safety rules and laws are made with the intention to retard design as little as possible, and to commensurate with a proper degree of safety. Theory and practice disagree as widely here perhaps as in most other channels; for the curtailment of freedom in design, for the safety of the masses, may mean the defeat of progress, through laws too broadly applied or too narrowly interpreted. Quite often both of these elements combine in the same instance, with a result that is painful. I have in mind a recent example. One of our departments had a belt splicing press of antiquated design and uncertain lineage, that in due process of time came up for redesign. It was a machine used in a certain field operation requiring that it be transported and used in widely separated regions. Requiring the use of steam, this machine needed a steam generator, the two parts of which would function as a unit. Portability, freight and fire hazard being important items, it was decided to attempt an electric boiler.

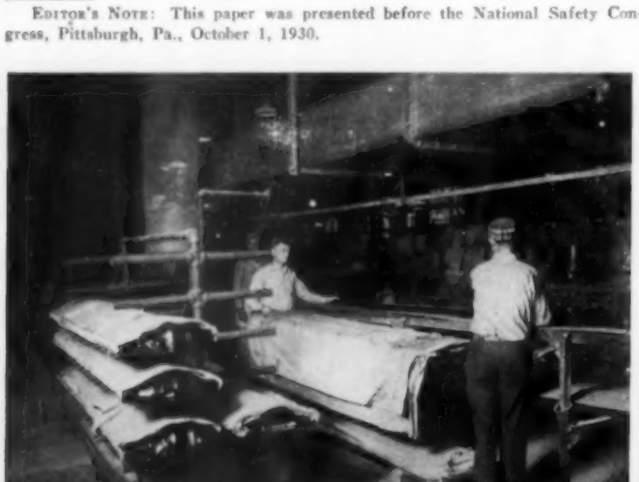
Inspections Under the Safety Code

Careful design indicated that the new outfit would perform its function in a much superior manner and weigh about one-fifth as much as the one to be replaced. However, being a pressure vessel, the device would appear to come under certain articles of the Safety Code and the local State representative was called in.

The press, being a comparatively modern innovation, there appeared to be no direct code provisions, but he deeming it necessary to class the device at least somewhere within the regulations, classified it under a broader heading. Being somewhat confused, the agent interpreted the intention of the law so meticulously that when the necessary changes were incorporated in the design and the device designed, it was rejected by the department on the grounds that it was so awkward and cumbersome that they would prefer to continue the use of the old one. This was so manifestly illogical that it provided an alibi for going higher, which brought in a more liberal interpretation, and the final result was, in this case, a fairly efficient and practical machine.

In the design of machines involving continual repetition of a certain movement, like the feeding of material between rolls, or

EDITOR'S NOTE: This paper was presented before the National Safety Congress, Pittsburgh, Pa., October 1, 1930.



Treads Hand Cut, Booked and Delivered by Truck

SAFETY *and* DESIGN

achinery and Factory Layouts With Regard odes Must Be Rigidly Followed

M. ARYANSKI
er, Goodrich Company

beneath punches, fatigue, monotony and familiarity breed especial danger. A person may make a certain movement ten thousand times in perfect safety, knowing that a slip on his part, in timing or distance, may mean the loss of his hand. At first, the danger lies in personal awkwardness and unfamiliarity with the timing of the machine, but after ten thousand movements, these elements are reversed and the danger lies in familiarity, monotony and fatigue.

The designer can seldom eliminate monotony, but he can nearly always eliminate fatigue. Frequent and well placed rest periods would help to arrest the danger of a sluggish and tired mind caused by monotony, also interest and cheerfulness on the part of the employee and his work tends to keep the mind clear.

Fatigue is caused by lactic acid accumulations from violent exertion. Muscles burn fuel in the form of sugar known as glycogen. Oxygen supplied through the lungs is carried by the red blood cells to all parts of the body. Any working muscle needing oxygen takes it from these red cells automatically. The faster the muscle works, the more fatigue creating lactic acid it generates and when the muscle works especially hard, lactic acid forms more rapidly than it can be removed. Our body is not constructed like a locomotive which consumes the same quantity of coal for every foot pound of work. When the body or mind is fatigued, even a small amount of work produces disastrous effects. The workman that persists in his task when he is already fatigued not only produces less effective work, but receives greater injury to his organism.

Fatiguing Effect of Machinery

The fatiguing effect of the roar of machinery is chiefly due to its influence upon the faculty of attention. There is thus in attention a sensation of effort, and fatigue of attention is in direct proportion to the continuance of the efforts and the difficulty in sustaining them.

The subject of noise in industrial establishments is usually dismissed with the remark that the workers "get used to it," and doubtless, in many occupations, the workers themselves are scarcely or not-at-all conscious of any increased application on their part, due to the noise. But, in the main, the process of getting used to it involves precisely that increased intensity of nervous effort, that "feeling of being coerced" and which is most favorable for the approach of exhaustion.

And so the rubber industry is keeping abreast with the latest and most modern applications which science discovers to conserve its human power.

For example: We have conveyors carrying the burdens, such as cooling conveyors on mixing machinery. Formerly a man cut a sheet of rubber off the mill, picked up a bar, placed it into a socket at a convenient height, threw the sheet of rubber over the bar, then lifted the bar with the rubber, placed it into a second socket to hang and cool. With a more improved method, a chain conveyor with hooks attached passes each mill, the man cuts the sheet off the mill and hangs it on the passing hook. Here, energy is saved which formerly was expended by handling on the bars.

Treads formerly were hand cut to length on a conveyor, picked up and placed in a book; the books were placed on a truck and when the truck was filled, the men would push the truck to one side and pull an empty truck into place for further loading. Under the improved method, the treads are cut automatically, the men pick the treads up, place them into books, the books when full are placed on a conveyor and delivered to the floor on which they are used.

Formerly, tube machines were purchased with spur gear drives causing considerable noise. In the new design, a Texrope belt drive is used, eliminating all noise, but the hum of the motor. We further eliminate fatigue by rotating jobs so that the worker uses different groups of muscles.

Light is possibly the most important tool used in any factory. Everybody uses it. Natural daylight, I believe everybody will agree, is the most desirable of two sources of light—natural and artificial —however, many illuminating engineers feel that artificial illumination will eventually reach the plane of natural illumination. In fact, many industries are working the major portion of the time under artificial illumination.

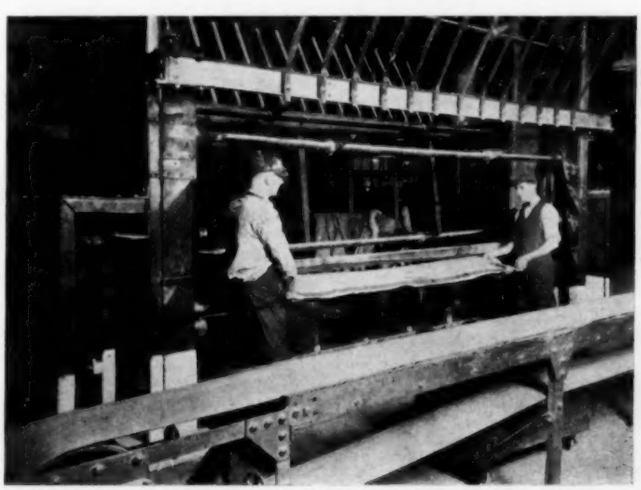
A vast amount of experimental work has been done in our laboratories and factory by Goodrich engineers to determine the proper intensity and character of light as related to the various operations conducted in the manufacture of our products and the carrying on of office work. They have also given careful consideration to the selection of lighting fixtures best adapted to types of buildings and operations carried on therein.

In addition, the design department has given special consideration to lighting in connection with each engineering project with satisfactory results. Each machine or hand operation is given careful study by our engineers with the object in mind of proper design for placement of lighting fixtures and lights as well as natural daylight to supply the most efficient light best adapted to the work. Considerable thought is given to protect the worker from direct or reflected glare. Sufficient general illumination is provided for safety.

Naturally, light intensity varies greatly in opinion according to location, class or nature of work, and the engineer under whose control the project may be.

A few samples of lighting intensities used at Goodrich are as follows:

Storage & Warehouse—2 to 4 ft. candles
Tire Building—10 to 15 ft. candles
Tire Inspection—25 to 30 ft. candles



Loading Tread Book Conveyor. Treads are Delivered to Floors on Which They Are Held

Mold Engraving—30 to 40 ft. candles
Drafting—25 ft. candles.

Operations where dark material or objects are used generally require higher intensities than white or light. This is true of black or dark rubber stocks.

The design of buildings and structures as related to safety and illumination is of paramount importance. Low, squatty, dark buildings are being replaced with more modern ones of generous areas with high ceilings, large, generous windows and painted with some bright reflecting paint. This not only adds to the desired natural illumination, but to the facilities for providing better and more efficiently designed units for artificial illuminating.

Special Lighting Problems

From a lighting standpoint, therefore, the decreased production of the early morning and late afternoon hours of the winter months and common to some industries inadequately lighted would be an unknown thing if given the proper perspective and attention.

The use of solvents and other flammable elements also require special lighting and accessories to guard against the fire and explosive hazard. Special lighting installations are required in instances where the inspection of finished materials of indelicate shades of color are carried on and light as nearly like daylight as possible is required.

Generally the foresighted illuminating engineer realizes when incorporating proper design in lighting that this is a wise investment rather than an expense.

Even with the very best of design and subsequent precaution, operators do get hurt and especially is this true on jobs involving the element of endless repetition and monotony, for the human brain can not always be alert; and even when the person is aware of the danger, his mind will stray from his work, a muscle will lag and his hand may not always get back to safety.

We have in mind the case of an experienced female operator, whose job was to feed roller chain side-bars under a double punch. After placing a side-bar in its receptacle in the jig, the girl was compelled to withdraw both her hands in order to touch two widely separated levers before the punch could descend. This machine was safe-guarded adequately, functioned satisfactorily and met with general safety approval. The agent who represented the company that built the press took pictures of the girl, sitting at the machine, which were published in their advertising as a shining example of a dangerous operation that had been rendered perfectly safe.

The girl was unusually alert and attractive and the agent fell in love with her. On the last day of her job, being on piece-work, with a counter that recorded each side-bar as it fell from the jig, she determined to set a record that would last. So she humped herself into an unnatural position, until she was able to reach the control levers with her elbows, and by a continuous pressure, operated the punch at its full speed. Expertness and alertness almost won the day—but not quite. At about fifteen minutes before quitting time, she failed to withdraw her hands in time and the result was a five-sixteenths inch diameter hole through the end of both index fingers.

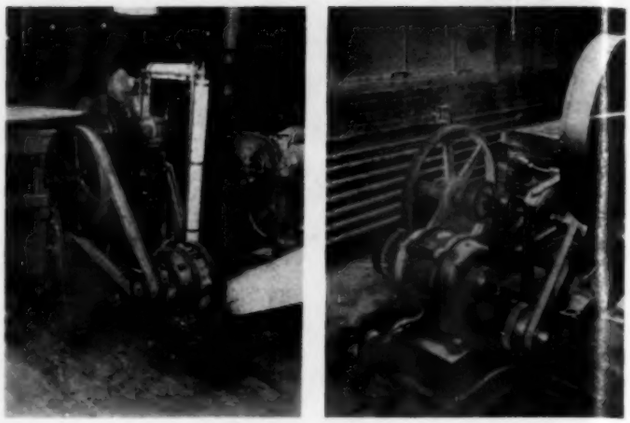
Materials Handling Problems

Materials transported, or heavy materials suspended above lines of traffic, are dangerous and require more careful supervision than is sometimes available to the erector of such menaces. Therefore, the State formulates codes and guides for the operation of such devices.

It used to be that labor saving machines were few and far between; they were simple in design, slow in action, lacking in power and usually operated by the owner. Today, machines are crowded into minimum floor space, complicated by multiple operation, high in speed and power and operated by male or female labor that may be changed almost daily.

When I started to write this article, it was attacked with enthusiasm—under the impression that the idea was logical—that safety and design belonged together, and I viewed the many pages devoted to safety articles in the "Industrial Arts Index" with delight, anticipating a rich repast of learned discussions on this subject. But, there were none! Several volumes of purely index matter were perused vainly. Of course, the idea is approached, from one angle or another, in almost everything written on the subject of Safety, but so far as I can find from the limited sources available, this is the first article on the subject of "The Relation of Safety and Design."

As a matter of fact, it is probably true that the reason for the existing high percentage of accidents in every walk of life today is largely a matter of design. If the engineers who laid out our streets could have foreseen the present conditions, they could have avoided them, had they been vested with full authority to do so. What I am getting at, is that design is not merely a simple matter of intelligent planning, even when the factors are known, but the result of a constant conflict over possibilities that may never materialize, resulting in a final compromise.



Left: Spur Gear Tube Machine Drive; Right: Texrope Belt Drive, Replacing Gears and Eliminating Noise and Vibration

An accident, until it happens, is problematical; after it happens, it is very real. The very persons who might blame the designer for the accident quite possibly are the ones who refused to allow him the necessary leeway to insure its prevention.

The highly inflammable film room of the Cleveland Clinic was located in the basement of the building, between the heating and ventilating room. What an ideal design for the terrible catastrophe that later occurred! The film caught fire—there were explosions, and the hot air ducts distributed the gases throughout the length, breadth and height of the great building. Here, indeed, was relation of safety and design—but with the right ideas completely reversed.

Safety Figures First in Designing

The price of safety for the machine from the design to the scrap heap, and for the operator from the cradle to the grave is eternal vigilance. There must be a co-operation of all departments, for safety is largely a matter of *accident prevention*, and the matter of design can be made to play a more vital and important part than it now does—along with the education of the worker and the public.

My message is first of all to the designer. Keep the ideas of safety in mind at every stroke of the pencil. Human lives are valuable. Arms, hands and eyes are priceless to the man or woman who works. Put such menaces as gears and chains, cranks and cams, not only under guards, but actually inside of the framework wherever possible. Remember that in nature, where the only code is the survival of the fittest, those animals live longest whose framework is on the outside or whose hide is the toughest; such as the turtle, the alligator, and the rhinocerous.

The relation of safety and design does not stop however with the designer and his machine. Our message is also to the worker. Keep safety in mind—all the time! It takes less than one second to have an accident. Don't be ashamed to think about safety or to talk about it to your fellow workers, and have courage to wear the safety protection provided, even though ridiculed for it.

We are even yet not finished with the relation of safety and design. The foreman knows the machines' latent danger. The superintendent must have an interest in the safety of his workers; knowing that the machine, no matter how carefully designed, can not be made to think, or feel or sympathize, or be humane in its action—it never reaches out its tentacles for anyone.

Therefore, since the best worker is sometimes lax, or careless, and ever subject to the human element; and since the machine can not be designed to think, reason or take back the fateful stroke, then it is up to the management to supply this link of safety in the relation of the designer to the machine and the relation of the worker to his machine.

SPAIN'S *Rubber Industry*

An Industrial Development Since the World War—Pirelli, S. A., is Largest Producer—Industry Made Up of Many Small Growing Concerns

Map of Spain Showing the Location of the Leading Rubber Manufacturing Centers with the Number of Establishments in Each

ONE does not look to Spain as an important rubber goods manufacturing country. Yet, the great increase in the number of rubber manufacturing establishments which have come into existence over the past few years, makes her a rubber manufacturing nation of no little potential importance. It is true that the industry has suffered reverses in the last two years, due to internal political troubles and the general world wide economic situation, but the foundation is there for a sizable industry when conditions become more normal and advantageous for trade.

The rubber manufacturing industry in Spain is characterized by the fact that while two or three large firms more or less dominate the local and export markets, there have arisen forty to fifty small concerns which have made auspicious beginnings. With Spain still importing over 70 per cent of her rubber goods and under the additional stimulus of a new protective tariff on various rubber articles, there would seem to be an excellent opportunity offered for a wide expansion in the industry. It is reported that the new tariff has been a particularly fortunate incentive to local manufacturing efforts, and the only thing, aside from the generally depressed economic conditions, which is hampering the industry, is the lack of skilled labor and experienced technical executives.

The estimated requirements of the country in tires is approximately 500,000 casings per annum, of which only 100,000 casings are supplied from local manufacturers. With the local market, not only in tires but other rubber goods, so inadequately supplied by local manufacturers, it is natural that Spain's export trade in these products would be negligible. Accompanying statistical tables show the official import figures for tires, inner tubes and other rubber goods. These figures have been taken from the Spanish Government reports. The quantity of tires is given in kilos in the government figures but has been converted in the tables to an estimated number of casings, based on an arbitrary figure of approximately 8 kilos per casing.

The local production of tires is centered largely in the Nacional Pirelli, S.A., the Spanish subsidiary of the great Italian rubber concern. Their estimated production during 1929 was around 75,000 casings and 125,000 inner tubes. At the present time, it is estimated that there are sufficient factory facilities throughout Spain for an annual production of 300,000 casings and 500,000 inner tubes. It is also estimated that the present production of solid tires is around 5,000 annually. Aside from the Pirelli company, the following are considered as the principal local manufacturers of tires and tubes: Fabricas Reunidos de Caucho y Apositos, S.A., Barcelona; Industria Astur, S.A., GiJon; Klein y Cia., Segovia; Manufacturas de Caucho Victoria, Madrid, and Industrias del Caucho Hutchinson, S.A., Madrid. The Victoria concern is well-known for its specialty in inner tube production, while Hutchinson is chief in the field of solid tire output.

The Spanish rubber goods manufacturing industry is practically a new growth. Before the World War there were little or no rubber goods manufactured there. The chief source of supply was Germany, whose leading producers maintained factory representatives in Bilbao and Barcelona with stocks on hand to fill both wholesale and retail requirements. The Allied blockade from 1914 to 1918, high rubber prices and increased duties levied on manufactured goods of all kinds, caused a considerable number of firms to commence manufacturing rubber goods locally on a

A View of Barcelona, the Chief Center of the Rubber Goods Manufacturing Industry of Spain

Official Spanish Import Statistics

Imports of Rubber Goods

Imports	1927 *Kilos*	1927 *Pesetas*	1928 *Kilos*	1928 *Pesetas*
Pneumatic casings	3,086,095	27,774,855	3,956,192	35,605,728
Pneumatic inner tubes	380,539	3,805,390	497,604	4,976,040
Tires with metal rims	669,511	4,586,597	508,083	3,556,581
Solid tires for carriages	8,197	73,773	4,821	43,389
Shoes, heels & pieces of shoes	39,518	355,662	71,544	643,896
Elastic fabric for shoes	3,561	92,586	1,006	26,156
Impregnated fabric	49,195	580,737	70,160	851,482
Elastic bands	14,071	520,627	11,113	411,181
Belting, valves	146,111	1,314,999	222,854	2,005,686
Pipes, tubes, packing, mats washers	163,401	1,797,411	170,133	1,871,463
Tubing	3,749	42,820	3,465	37,278
Pneumatic tires cut in pieces	5,616,900	3,322,539	8,637,200	5,289,636
Vulcanized thread	42,674	640,248	53,465	801,975
Elastic rings & armlets	4,437	84,303	3,837	72,903
Rubber toys	7,838	211,626	3,300	89,100
Surgical articles	5,693	170,790	3,566	106,980
Combs and hairpins	22,193	554,825	24,154	603,850
Dress shields	735	17,640	1,191	28,544
Other articles	21,579	604,212	17,805	498,540
Total	10,285,997	46,550,640	14,261,493	57,520,308

NOTE: *The Peseta is now quoted around 11 cents. Its par is 19 cents U. S. currency.*

Estimated Number of Pneumatic Casings

Country of origin	1926	1927	1928	[1]1929
Germany	1,753	1,385	16,671	30,355
Austria	4	1	30	—
Belgium	349	23	3,519	17,505
Canada	573	1,788	5,902	31,792
United States	44,755	148,333	161,228	252,094
France	91,802	143,720	153,350	101,626
Great Britain	29,321	23,312	56,542	64,551
Italy	70,405	58,596	85,999	56,832
Switzerland	—	21	286	173
Other countries	18	10	6	100
Total	238,980	377,189	483,533	555,028

Estimated Number of Inner Tubes

Country of origin	1926	1927	1928	[1]1929
Germany	2,949	1,404	21,879	32,610
Austria	8	—	33	—
Belgium	340	29	2,951	23,034
Canada	2,430	9,254	7,860	41,083
United States	61,743	138,506	136,389	175,358
France	307,011	217,570	303,823	230,920
Great Britain	30,529	49,116	72,082	86,771
Italy	7,773	2,659	2,104	7,717
Other countries	25	54	243	309
Total	412,808	418,592	547,364	597,803

Estimated Number of Solid Tires Imported Set on Metallic Rims

Country of origin	1926	1927	1928	[1]1929
Germany	4,736	3,618	3,529	2,203
Canada	—	100	47	52
United States	6,869	11,345	3,649	1,309
France	10,813	9,251	10,396	8,155
Great Britain	3,144	2,269	1,771	891
Netherlands	147	35	835	—
Italy	100	162	95	71
Belgium	—	—	—	8
Total	25,809	26,780	20,322	12,689

small scale. Many of these firms have now grown to some importance in the industry.

Figures are lacking as to the production of rubber goods in Spain and their total value, but aside from tires there is a steady increase reported in the output of mechanical goods and particularly has there been an advance in drug sundries and hospital supplies. As below stated, the lack of technical experience and skilled labor has presented difficulties, but this is being gradually overcome. A number of local firms have finally been successful in the production of hot water bottles, after a number of years of unsuccessful effort. Orthopedic rubber goods are important items in the local industry and more and more molded products are also being produced.

On the whole the Spanish rubber manufacturing industry is firmly established and only awaits more stable economic conditions to grow to an important position among rubber goods producing countries.

World Trade *in* Rubber Footwear *in* First Half *of* 1930

IN THE international trade in rubber footwear for the first six months of 1930, as compared with the corresponding period in 1929, the United States, Canada, the United Kingdom and France—all leaders in the trade—registered declines, while Japan, Germany, Poland, and Czechoslovakia—formerly minor factors—recorded gains varying from 60 to more than 1,000 per cent, according to the latest advices of the Department of Commerce.

Japan has become the leading exporter of rubber footwear, shipments from that country during the first half of 1930 amounting to 5,394,000 pairs against 4,028,000 pairs by the United States. The exports by countries follow:

World Exports of Rubber Footwear, First Six Months

Country	1929 *Pairs*	1930 *Pairs*
United States	5,504,000	4,028,000
Canada	4,810,000	4,586,000
United Kingdom	1,947,000	1,672,000
France[1]	2,238,000	1,250,000
Japan	3,280,000	5,394,000
Czechoslovakia	25,000	447,000
Germany	277,000	695,000
Sweden[1]	543,500	273,000
Poland[1]	1,075,000	1,300,000

[1]Pairs estimated from reported weight in kilos.

The decline in exports of rubber footwear from the United States and the other countries is not attributed wholly to the worldwide economic depression. Perhaps the unsettled state of international affairs has to a certain extent contributed to a decrease in the consumption of rubber boots and other waterproofed footwear, but the economic depression has acted as an impetus to the trade in canvas rubber-soled shoes. The reduced purchasing power of the consumer has caused him to patronize the canvas footwear instead of the more expensive leather shoe. In the United States the canvas rubber-soled shoe is worn principally for sport, but in the more primitive countries it is considered a few steps above barefootedness and the crudely homemade contraptions worn by the peasants. Thus the canvas shoe paves the way for the leather article, but under world conditions many persons who had advanced to the use of leather shoes have been compelled to revert to the lower priced canvas footwear.

Countries that have been producing canvas footwear in the past are now meeting competition from such agricultural countries as Mexico, Portugal, Cuba, British Malaya, Bulgaria, Yugoslavia, Spain, Brazil, and even Syria is producing canvas rubber-soled shoes which for many purposes meet the requirements of the local populace.

Exposition of Chemical Industries

PLANS for the Thirteenth Exposition of Chemical Industries, which will be held at the Grand Central Palace, New York City, during the week of May 4, 1931, are in progress and rapidly taking shape. About three hundred exhibitors are reported to have already reserved space for the forthcoming exposition, among which are a number of the chemical suppliers to the rubber industry.

The exposition is managed by the International Exposition Company, with permanent offices in the Grand Central Palace, under the management of Charles F. Roth and F. W. Payne.

Toxic Substances *in the* Rubber Industry

PART XVI

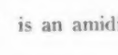
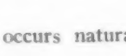
By **P. A. DAVIS, A.B., M.A., M.D.**

Assistant Medical Director, Goodyear Tire & Rubber Company

GUANIDINE COMPOUNDS

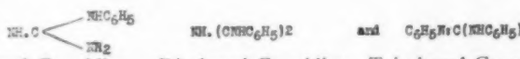
GUANIDINE or its compounds are used extensively in the rubber industry as accelerators. The quantity used at any one time is not large but the scope of its use is extensive. Guanidine itself is not used to any great extent but its derivatives are.

The chief guanidine compounds in general use are the following: phenyl-guanidine, di-phenyl-guanidine, tri-phenyl-guanidine and di-ortho-tolyl-guanidine.

Guanidine  is an amidine and is very closely related to urea  It occurs naturally in beet juice and vetch seeds and when purified occurs in crystals which are very soluble in water and alcohol. The phenyl-guanidines are less soluble in water unless acidulated with acetic acid.

From the chemical structure of the compound and its close relation to urea one would not expect a very toxic substance, however guanidine is highly toxic in some of its reactions but as the molecule become more complex by the addition of the phenyl groups the toxicity becomes less. The following formulas show the relation:

Urea — *Very little toxicity*; Sulpho-Carbamid — *Toxic*; Guanidine — *Toxic*



Phenyl-Guanidine — *Slight toxicity*; Di-phenyl-Guanidine — *Slight toxicity*; Tri-phenyl-Guanidine — *More toxic*

Guanidine and its radicals are mostly mono-acid-bases and are decomposed in the presence of heat and sulphur compounds, the mono-phenyl guanidine yielding di-phenyl-sulpho-urea and potassium sulpho cyanate, and the tri-phenyl guanidine yielding amine, phenyl mustard oil and hydrogen sulpho cyanide. The by-product from the milling and heating from the use of the guanidines are more or less toxic, however the complexity of the substances becomes lost and the unchanged guanidines often bloom out after the rubber has been cured and aged a short time.

Guanidine Radical Highly Toxic

The guanidine radical is highly toxic and has a pre-dilection for the muscular system of the body. Small doses of guanidine are often excreted unchanged but large doses often combine with the muscle substance and produce muscle twitchings and affect their contractility. Very large doses may cause a cyanotic condition to develop and as such it produces a hemoglobin combination. Small quantities of guanidine when given to or fed to chlorophyllous plants are injurious. The human system may take small quantities without any serious results. When the substitution products are formed they become more soluble and less toxic.

The small amount of the guanidines used almost forestalls any serious effects from the handling of material, but during the milling processes one must be cautious of the disintegration products.

The products yielded in rubber mixing and milling that are produced from tri-phenyl guanidine are more toxic than those produced from di-phenyl guanidine and di-ortho-tolyl guanidine.

Men who have been working with these compounds have been examined every 90 days for 15 years. No serious cases have been found and the symptoms are very slight and consist of mostly local manifestations.

1. Slight conjunctivitis
2. Slight coryza
3. Occasional bronchitis
4. Occasional gastric disturbance
5. Rare and mild dermatitis, this occasionally becomes worse if the perspiration is acid
6. Sore muscles and occasionally muscle spasms or cramps
7. In the case of triphenyl guanidine there is some muscle ache but this is due to sulphur compounds
8. Urine and blood shows no changes except an increase in urea and the presence of unchanged guanidine compounds

Some individuals have worked with the compounds for 15 years or more and have not shown any symptoms of any kind. This is due to the small amounts used and the ability of the system to excrete small amounts unchanged through the kidneys and bowels. We have experimented on the toxicity of guanidines by using guinea pigs. The phenyl guanidines are more or less insoluble in water and in order to produce a solution sufficient for hypodermic injections it was necessary to make an acidulated solution, using a few drops of acetic acid. Guinea pigs were injected subcutaneously with ½ cc of this solution every 2nd day and then every day. The observations did not reveal any symptoms, no muscular twitchings, no gastric disturbances, no loss of weight, no local disturbances, no dermatitis, and if this type of experiment is of value then one must conclude that there is very little toxicity to the pure compounds but as they pass through the milling processes certain toxic substances are produced. If the commercial products contain any cyanides or sulpho-cyanides one must take cognizance of this fact. The manufacturer of the guanidines has his problems but it is not one of the guanidines, but of the by-products formed in the manufacture. There has been some mention of a cyanosis developing from the guanidines. This is, I believe, due to the formation of diphenyl thio-urea and the subsequent decomposition and the formation of some anilin. When triphenyl guanidine is incorporated in rubber and later this is subjected to great heats, a certain amount of phenyl-mustard gas is produced and this is very irritating to the eyes, mucous membrane of the nose, throat and lungs. In certain cases it produces a dermatitis. There is also some di-phenyl-amine produced which is toxic.

Preventive Measures

The guanidines produce a group of compounds that are very valuable to the rubber industry as accelerators and will continue to be used until some other group is found to be better. However, the amount used as compared to the amount of rubber that it is combined with is very small and since the degree of toxicity of the phenyl guanidines is small one does not have to fear any serious developments.

The following safety procedures should be followed:

1. Keep the hands and the exposed parts free from the compound.

2. Keep from disseminating it through the air in order to prevent inhaling it. This can be done by having hoods over the mills.
3. When tri-phenyl guanidine is used and the heat of combination is high and there is much sulphur present, the process should be carried out under proper hoods and with suction ventilation, for phenyl mustard gas is produced and it is very irritating.
4. Removal from contact with the compound if any dermatitis, coryza conjunctivitis or bronchitis develops.
5. Instruct the workers as to cleanliness of their hands at the time of eating.
6. Frequent examinations of the individual. The urine should be given special attention. The blood is not diagnostic and shows only a toxic anemia. The color index is usually low. The total solids are increased and the original substance can often be obtained unchanged. The phenyl groups can always be detected when only small amounts are absorbed.

Curative Measures

There is no specific treatment. Removal from contact, elimination and alkalinization of the system by calcium salts. For dermatitis use bland lotions, alkaline, and later expose to the sunshine.

The conjunctivitis and other irritative conditions of the mucosa usually subside on removal from exposure.

Conclusions

Guanidine itself is not used extensively and since it is the most toxic, very little trouble will be experienced.

The phenyl guanidines in pure form are only slightly toxic and the amount handled is so small that about the only conditions that one observes is a slight dermatitis on the wrists and arms or an irritative condition of the eyes, nose and throat, and this is only an occasional occurrence. We have examined workers who have never developed any irritation. However the same stock of rubber may produce irritative conditions on a different process where the heat of curing is high, but it is usually due to the formation of phenyl mustard gas.

If the ventilation is proper and the safety instructions observed one should experience no difficulty in using the guanidines.

Ford Gives Tires Rigorous Tests

IN order to test tires under conditions approximating as closely as possible those to be met in actual service, the Ford Motor Company has constructed a machine on which tires are run for hundreds of miles over concrete "roads" without leaving the laboratory.

This machine, the first of its kind, has two cast iron fly-wheels, eight feet in diameter, the rims of which are filled with concrete similar to that used for road building. A Ford chassis is placed on top of the wheels in such a way that one tire rests on each concrete rim. The rear end is weighted to approximate the weight of a car with passengers or a truck with load, depending upon the tires being tested.

The driving force is applied through the rear end with the result that the tires, in revolving the concrete wheels on which they rest, encounter a resistance which gives the effect of steady uphill climbing on a concrete road plus the action that the tires receive when turning sharp curves, alternating from left to right. Every tire tested is run a minimum of 500 miles at a speed of 25 miles an hour, the brakes being applied and the car stopped every five minutes. This is equivalent to several thousand miles of actual service on the roads. In other instances tires are run until they wear out.

Tires for Ford cars are supplied by several manufacturers. But, before being accepted, several picked at random from each shipment must pass tests as severe as any punishment they would receive on the road. The concrete machine, which supplements a similar contrivance with ordinary cast iron fly-wheels, gives but a part of the test.

First each tire to be tested is inflated and mounted on a drop testing device which lets it fall on an anvil at a sharp angle with sufficient force to press the casing against the rim at the point of contact. Seven times this gruelling punishment is repeated at as many points around the circumference with the air pressure reduced two pounds before each drop.

The strength and resistance of a tire depends to a great extent upon the quality of the fabric in it. If a poor grade of cotton is used the drop test will break the cords, just as they would be broken or weakened by running over a sharp rock or into a curb. The break would not be immediately noticeable in service, but sooner or later it might result in a blow-out.

After having passed the drop test, the tire is given its run on the cast iron wheel to test for separation of cords. Then it is put through the drop test again, but this time the opposite side of the casing strikes the anvil. Next it is given the run on the concrete wheel to test the wear of the tread.

Finally the casing is stretched open and carefully examined. If there is the slightest sign of a break, the whole shipment is held up.

Argentine's Rubber Goods Industry

ARGENTINA has a very small but growing industry in the manufacture of rubber goods, according to Department of Commerce reports. Imports of crude rubber, including reclaimed and scrap, increased four-fold between 1925 and 1928, reaching a total of 601,348 kilos in the latter year. In the previous year imports were only 269,895 kilos, the percentage supplied by various countries being as follows: The United Kingdom 47, British possessions 34, United States 7, Brazil 2, Dutch possessions 3 per cent, and other countries 7.

The principal rubber products manufactured in the Argentine are mechanical rubber goods—rubber rings, washers, stoppers, water-closet balls, gas tubing, hose, floor mats; rubber insulated electric cable; druggists' sundries—hot-water bags, ice bags, douche bags, tubes, stoppers, droppers, and the like; orthopedic goods—corsets, stockings, ankle braces and bandages of rubber, massage rolls, and the like; shoes and findings, canvas rubber-soled shoes, rubber heels, inner heels, corn plasters, and levelers; various other articles—pneumatic and sponge rubber cushions, sponge rubber goods, wheels with solid rubber tires, molded articles in general, rubber for wind shields, tire-repairing compounds, rubber in sheets, and rubber balls; and ebonite, in sheets, tubes, and bars.

Three European rubber manufacturers operate branch plants in Argentina—the Italian Pirelli, mostly for insulating electric cables, the German Continental, and the British India Rubber Company. Then there is one large, long-established Argentine manufacturer, Colautti & Cia., and a half dozen smaller Argentine manufacturers.

Although the official Argentine import statistics make no distinction between crude, reclaimed, and scrap rubber, it is estimated that from 20 to 25 per cent of the rubber used is reclaimed rubber, and less than 5 per cent of the rubber imported is scrap rubber. There is one Argentine-owned reclaiming plant—Calautti—which utilizes the old automobile tires and tubes, of which there is always a large local supply. It is very infrequent that scrap rubber is imported from the United States, but several tons of reclaimed rubber are imported monthly.

At present Argentina produces only a very small proportion of the rubber goods it consumes, and production is limited mostly to the cheaper grades. It may be expected, however, that the local industry will continue to grow and to improve the quality of its products, and thus it will import crude and reclaimed rubber in increasing quantities.

Firestone Talks on the State of the Rubber Industry

Main Problems Are Those of Merchandising and Distributing — Crude Rubber and Cotton Prices Are Nearer Point of Stabilization Than Ever Before

HARVEY S. FIRESTONE, JR.

AN estimated production of crude rubber totalling 830,000 tons against a probable consumption of only 665,000 tons for 1930, was the prediction of Harvey S. Firestone, Jr., in his recent address before the Seventh Conference of Major Industries, held in Mandel Hall of the University of Chicago, October 22. His solution for the successful merchandising of tires lies in the complete servicing of the tires offered to car owners, thus establishing a satisfied clientele. After an interesting sketch of the history of the rubber producing industry, Mr. Firestone outlined the present problems in the crude rubber situation and their probable effect on the rubber goods manufacturing industry.

"Rubber and fabric together account for over 75 per cent of the total cost of materials in a tire," said Mr. Firestone, "and as manufacturing costs have steadily declined they form the major part of the total cost. It is easy, therefore, to understand what very serious inventory problems have confronted the tire manufacturer, in addition to the natural problems of a rapidly growing industry. For example, a minimum necessary inventory of crude rubber for our company valued at $40,000,000 in December, 1925, was worth only $20,000,000 four months later. This gives you some idea of the reason for the peaks and valleys of the earnings—and the casualties—in the industry. In 1922 there were 166 rubber tire manufacturers; today there are only 36.

Raw Materials Nearer to Stabilization

"However, with rubber and cotton at the lowest levels in history, we believe that they are nearer to stabilization than they have ever been, and we can look forward to much more stability in the future than we have had in the past.

"As Thomas A. Edison has impressed on me many times when I had the pleasure of being with him, there are no great accomplishments without great difficulties and hardships. The rubber industry has played a prominent part in bringing about the high economic and social standards of our country today. America's outstanding position in the world can, in no small measure, be attributed to her transportation systems in which rubber plays such an important part.

"I do not know of any industry that has made greater progress in its manufacturing methods than rubber tire manufacturers have made. To illustrate, I give you this example. In 1913 a man could produce an average of ten tires in ten hours. Today, in the same number of hours, he can make one hundred. A first quality tire for a Ford car in 1913 listed for $22.95 and average 3,500 miles. Today a first quality tire for a Ford car sells for $9.70 and averages 15,000 miles. This means that the car owner paid $10.00 in 1913 for the same tire value that he gets today for $1.00. This is in striking contrast to the fact that the average of all commodity prices now is 40 per cent higher than in 1913. With such a record, it is not surprising that the rubber industry has grown until today it does a billion dollar business yearly.

"Our great problem today, which is the major problem in nearly every line of industry, is the readjustment taking place in the field of merchandising and distribution. For the tire industry it is intensified by the question of service in its distributing system. Some rubber companies have chosen to manufacture a line of tires under special brands for others to distribute without giving service. We feel that the elimination of service to the car owner is a step in the wrong direction. Instead, we believe that the giving of a much more comprehensive service, of a higher standard, is the real answer. To this end we have developed the idea of a one-stop master service station at which the motorist is able to secure in one place a complete service for his car, including gasoline, oil and car lubrication, tires, tubes, batteries and their repair, brake testing and relining, car washing and other needs which formerly he was forced to seek in many different places.

"We have realized that it is increasingly difficult for the tire dealer to maintain his business at a profit selling only tires. The reduction of the number of tire dealers from

100,000 to 75,000 in the past two years bears witness to this. For this reason, therefore, we have added to our line our own make of batteries, brake lining and other car needs, so that we are in a position to offer the tire dealers today a complete program with which he can successfully meet the new conditions of merchandising and distribution.

"Our program for complete service to the car owner naturally necessitates additional capital, both for proper housing and increased inventory. At times, this is the real stumbling block to a progressive dealer. In selected cases, therefore, we go into partnership with this dealer in a separately formed company, of which he is the head. Through this method of cooperation over 400 of our master service stations have been established in as many cities in this country.

Importance of Service

"Service has proven itself of great value, not only to the individual car owner, but to the large consumer of tires such as taxicab companies, bus lines and fleets of trucks which are carrying an increasingly larger share of the nation's burden. For over 15 years, here in Chicago, we have undertaken the complete maintenance of a tire service on Yellow Cabs which has resulted not only in relieving the cab company management of this important phase of cab operation, but in the remarkable reduction of cost from 2 cents per cab mile to less than ½-cent per cab mile. Likewise, we perform similar service for many bus lines throughout the country. We also have a nation-wide arrangement by which our especially equipped service trucks provide regular and reliable tire maintenance service to owners of fleets of trucks who benefit through increased mileage and consequent lower operating costs.

"The importance of service in the tire industry can not be over-estimated.

Overproduction and Price Competition

"Another problem of the tire industry in the past few years has been that of excess capacity with its attendant evil of excessive price competition. There have been several contributing causes. The first has been the necessity of anticipating future market requirements. Tire manufacturers, in order to provide for the market, have, from time to time, enlarged their plants based on expected increased demand for motor cars. Unfortunately, however, this demand has not increased uniformly, so that abnormally large years of car production have proven a false and deceptive index to the rubber industry as to how it should prepare. Further complicating this problem has been the repaid improvement of manufacturing methods which, through new design and more efficient operation, has greatly increased capacity within the same four walls. With the improvement in manufacturing methods naturally came the improvement in product, so that increased mileage added another uncertain factor to the problem.

"However, the condition of over-capacity is now well on the way to correction. Many plants have gone out of business; others have been converted to other uses. It is entirely reasonable to forecast that within a comparatively short time the natural increase in the demand for tires, together with the ever increasing new uses for rubber, will satisfactorily solve the question.

"I should like to say a few words about the new uses of rubber. There is no raw material whose potentialities for commercial development are greater. Although more than 30,000 different rubber articles are now manufactured, we know that we have only scratched the surface as to the ultimate uses to which it will be put. Wherever vibration and shock must be eliminated, it is with rubber that the solution is sought. It will be through rubber that the strenuous drive for noise elimination in large cities will become a practical fact. Rubber flooring, rubber walls and rubber paving blocks provide the quiet so necessary to hospitals. As steel before it, rubber has proved to be an ideal substitute for other raw materials. Today all publications of the Rubber Growers' Association are printed on paper containing rubber latex. This is only an instance of where rubber may, in the future, be put to service to supply many of the things we now have in another form.

Optimistic as to Future

"No industry has the right to look forward to a brighter future than the rubber industry. It furnishes a product without which no automobile can be run, and we now know that no matter what may be the economic condition, the people will continue to use their cars. This year the sale of gasoline has increased each month over the corresponding month of last year, when more gasoline was consumed than at any time in history. This is clear evidence that despite the conditions, more motor cars are running today than at any previous time. This year 55,000,000 tires will be sold; last year over 70,000,000 tires were sold. Knowing that the use of cars is greater today than ever before, there can be no question that not only the increased mileage which has been built into tires during the last few years is being absorbed, but that an unusually heavy replacement tire business is now in the making. For this reason, coupled with the fact that rubber and cotton are at the lowest price in history, removing any reasonable possibility of inventory losses, the rubber industry looks forward with optimism to a successful and prosperous year in 1931."

Soviet Russia's Rubber Projects

ACCORDING to the *Economic Review of the Soviet Union,* the newly organized trust for the development of rubber plantations has already begun work on the rubber plantations located in the Kuyuk Mountains in Kazakstan. More than twenty million rubber-bearing plants of the Tausaghi variety will be plented in that section. The yield this year is expected to be more than 200 tons and that for next year, 1930-31, is expected to be 2,500 tons.

In order to facilitate work on the rubber plantations the workers of the Leningrad and Moscow rubber factories have organized brigades which were to leave for Kazakstan early in September for the purpose of collecting Tausaghi seeds. A new experimental factory for the extraction of rubber from rubber plants is being erected in the Kara-Tau Mountains, which it is expected to complete by October 15. It is also planned to establish two technical colleges for the study of rubber, in Moscow and in Kiev, and also two institutes in Kiev and in Alma-Ata (Kazakstan).

Doctor Zaretski (left) working among the plants in which he is said to have discovered a large rubber content

Doctor Makogon, shown at the right, is another Soviet scientist active in this development.

RECLAIMED RUBBER vs CRUDE

A Brief on the Advantages of Reclaimed as an Established Ingredient in Rubber Compounding—It is No Longer a Substitute for Crude But an Essential Component

THE following argument for the continued use of reclaimed rubber in compounding has been prepared by a prominent executive in one of the leading reclaiming companies. It furnishes considerable food for thought. The importance of reclaimed rubber in the present state of the manufacturing industry is best expressed by the words of Samuel Woolner, Jr., president of the Kelly-Springfield Tire Company, and head of the Rubber Manufacturers' Association, when he recently said, "A certain amount of reclaimed rubber is essential to the manufacture of rubber products because it possesses certain qualities not found in crude. There is no complete substitute." [Editor.]

THOSE who make a business of compiling statistics tell us that there were in 1929 fifty-one pounds of reclaimed rubber used to each one hundred pounds of crude. These same statisticians further tell us that the ratio of reclaim to crude has dropped appreciably during 1930 and there is much conjecture as to how far the substitution of crude for reclaim will go. Those who are identified with the manufacture and sale of reclaim believe that such substitution has gone beyond sound economy.

Reclaim is a valuable compounding ingredient. It has in addition to actual rubber value several unique and important characteristics which make its use desirable and even necessary. Those who have not had a long experience in the use of reclaim do not know of these good features and probably some who have been extensive users of reclaim do not fully appreciate these valuable properties.

Special Advantages of Reclaim

Reclaim is less thermo-plastic than crude and is therefore less easily influenced by variations in the major processing operations in a rubber plant, as milling, calendering, extruding and molding. It has a steadying influence on both plasticity and cure. Those who use no reclaim are often beset with the very annoying trouble of blisters when calendering in thin sheets or when extruding. These blisters in many cases disappear completely when some reclaim is used in the compound. The very annoying matter of shrinkage in the processing and vulcanizing departments can be minimized when used with the proper reclaim. A very good example of this is found in manufacturing mats for automobiles and particularly in molded one-piece running boards. Stocks high in reclaim content process well for this work and the finished running board is trimmed just after leaving the press and while still hot. Let those who do not feel sure of the good and valuable influence of reclaim on shrinkage compare the high reclaim stock for this purpose with an all-crude stock.

A rubber article made from a stock without reclaim will not resist oil as well as one properly compounded with a generous amount of reclaim.

The stabilizing of plasticity by reclaim is easily shown by running insulated wire from a stock high in reclaim and from one of equal cost without reclaim. Unless the insulated wire is sheathed prior to curing, the all-crude stock will distort much more readily and consequently produce more damaged goods. In this instance and in many others it is not possible to compound crude rubber with the cheap non-rubber compounding ingredients and produce a stock which will have the all-around desirable features of reclaimed rubber.

For many purposes reclaim is desirable as a companion of crude regardless of the price of the latter. This is proved by the fact that reclaim is being used in some goods at a price above that of crude rubber.

If reclaim were suddenly and permanently unavailable the rubber goods manufacturers would certainly have a higher payroll and power bill for turning out an equivalent volume of goods from crude rubber because of the longer processing time and greater power required. The cost of rewriting all compounds to exclude reclaim and the adaptation of these new compounds to present factory conditions and speed of output and the tests necessary to approve the new goods would certainly amount to an enormous sum of money and cause lots of grief.

Reclaim More Stable in Price

The price of good quality reclaim is such today that unless crude is to be bought at 10 cents per pound or below for a period of years it would not be good business to curtail the use of reclaim. Who believes or hopes that crude will average 10 cents a pounds or lower for the next three to five years? Fluctuations of the price of crude has been one of the most disturbing factors confronting the rubber goods manufacturer for several years. The price of reclaim has on the other hand changed gradually and within narrow limits and has never been a cause of much concern to the consumer.

The rubber industry can well afford to use all of the reclaim available yearly and it is the logical consumer of this material. Discarded rubber products are too valuable to go unused and if the rubber industry does not make use of its regenerated goods they must be consumed by other industries. It would probably be good business for the reclaimers if they should be forced to go afield to dispose of their products, but once done this would undoubtedly be, in the long run, unfavorable to the rubber goods manufacturer.

EDITORIAL COMMENT

Will Rogers on Tires

THE famous humorist often indulges in short truisms which are excellent tributes to domestic industries. Recently he made a particularly pithy remark on the tire business. In a dispatch from Beverley Hills he says, "Got back home without a puncture. We may have depression but we have got good tires. They are worth the money now."

They certainly are. We hear about various cities starting campaigns of "Buy Now" as a stimulus to the present retail situation. A similar campaign would be an excellent thing for the tire industry at the present time. Here is a specific instance of where the long-sought leadership within the industry could assert itself. The Rubber Manufacturers' Association and the National Tire Dealers' Association have an opportunity here to render a real service.

With tires at present prices and with their greatly increased road performance, they are genuine bargains. According to a recent statement of Harvey S. Firestone, Jr., a first quality tire on a Ford car in 1913 was listed at $22.95 and averaged 3,500 miles. Today a first quality tire on a Ford sells for $9.70 and averages 15,000 miles. This means that the car owner is paying today only $1.00 for the same tire value he paid $10.00 for in 1913.

Merchandising Crude Rubber

IN a paper read before the Congress International d'Agriculture Tropicale, P. J. Burgess, chairman of the London Advisory Committee of the Ceylon Rubber Research Institute, makes some interesting observations and incidentally hits upon a point which might well give the rubber producing industry considerable food for thought. He stressed the fact that while there had been an immense amount of research work done in connection with the scientific growing of rubber, little or no research or constructive thought had been exercised in the field of merchandising crude rubber in the interests of the producers. The speeding up of the machinery of production without a corresponding change or adjustment in the machinery of distribution and absorption is largely responsible, he claims, for the unfortunate situation in which the rubber producing industry now finds itself.

Efforts looking toward the exploration of new uses of rubber and more economical methods of packing and handling would come into this field for practical research. It is true that some efforts along these lines, particularly in the field of research called "propaganda," has been made, but a great deal more is possible. His thought is worthy of some serious consideration.

Geddes and Miller Disagree

IN HIS speech at the annual meeting of Harrisons and Crosfield, H. Eric Miller, chairman of the board of directors, took occasion to challenge the views of Sir Eric Geddes, as commented upon in these columns a few issues back.

"Sir Eric's anxiety," said Mr. Miller, "to attribute to the Stevenson scheme the increase in Asiatic ownership of rubber has led him to overlook certain facts which may be briefly stated. He says that up to 1915 the industry was practically all in European hands. An official census was taken of the area planted with rubber in British Malaya at the end of 1921 and showed that about 600,000 acres, or nearly one-half the total acreage in Malaya at the end of 1915 were in Asiatic hands.

"The spectacular rise in price in 1925 encouraged extensions throughout the East, but the rise was due to the faulty buying policy of the manufacturers in 1924 and not to the Stevenson scheme in itself.

"Sir Eric says that under the urge of high prices it is estimated by most careful investigators that production can be very quickly raised to 350,000 tons per annum. What two of these investigators, Mr. Taylor and Mr. Stevens, actually said in the concluding part of their report to the Rubber Growers' Association in 1929 was:

" 'If the rubber planted in the other countries of the Dutch East Indies is comparable with that which we have seen in those visited, it is possible that the output total as much as 300,000 tons in six to eight years' time, provided the price of rubber is in the neighborhood of 1s. 6d. per pound.' "

All this debate is very interesting, but shows that even in the close family circle of the British rubber growers, opinions are not unanimous and the "best minds" are not yet made up on the ways and means for pulling the industry out of the present unfortunate predicament.

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The Rubber Industry's CURRENT NEWS

Financial—Personals—New Rubber Products—
Building Operations—Manufacturing—Exports

NEW OFFICERS NAMED BY RUBBER SECTION, N. S. C.

E. R. Lawler, of the Woonsocket Rubber Company, Woonsocket, R. I., was elected general chairman of the Rubber Section, National Safety Council, at the annual congress held last month at Pittsburgh. C. L. Hungerford, Firestone Tire & Rubber Company, was named as vice-chairman, and J. R. Hanson, United States Rubber Company, Detroit, Mich., was chosen to act as secretary.

The executive committee for the ensuing year will consist of J. T. Kidney, Goodyear Tire & Rubber Company, Akron, O.; E. W. Beck, United States Rubber Company, Passaic, N. J.; H. T. Martin, Fisk Rubber Company, Chicopee Falls, Mass.; M. A. Quirk, United States Rubber Company, Detroit, Mich.; and W. L. Schneider, B. F. Goodrich Company, Akron, O. The editor of the News Letter for the year will be A. P. Regal, Philadelphia Rubber Works Company, Akron, O.

Committee chairmen for the year will be the following; poster, R. Kastell, United States Rubber Company, Passaic, N. J.; program, M. A. Quirk; membership, W. L. Schneider; publicity, R. A. Bullock, Corduroy Tire Company, Grand Rapids, Mich.; statistics, H. W. Low, Miller Rubber Company, Akron, O.; health, Dr. J. N. Shirley, Hood Rubber Company, Watertown, Mass.; engineering, C. B. Mitchella, Republic Rubber Company, Youngstown, O.; slides and safety kinds, T. G. McKenna, Goodyear Tire & Rubber Company, Akron, O.

WOOLNER SEES 1931 AS BETTER YEAR FOR SALES

Better conditions in the tire industry for both manufacturers and dealers were foreseen in 1931 by Samuel Woolner, Jr., president of the Kelly-Springfield Tire Company and of the Rubber Manufacturers Association in a recent newspaper interview. Both factories and dealers will start the year with low inventories, Mr. Woolner said, and there are prospects for a large replacement business owing to deferred tire purchases this year. He also predicts increased original equipment business due to higher production of automobiles.

"The public has been economizing on buying of new cars this year," Mr. Woolner stated, "and I look for a certain amount of replacement of old cars by the public next year. That, too, will increase the demand for tires."

Fire Engine Tire Record

The fire department of Glendale, Cal., recently published records showing that its engines and trucks in seven stations had experienced no punctures or blowouts in eight years. Pneumatic tires and also solid rubber tires last four years before being removed for replacement and even then are not worn out. Chief A. H. Lankford pointed out that the solid tires do not wear out, but the rubber becomes so hard that the desired cushion is lost and the jar becomes too much for the motor to stand successfully.

FIRESTONE FACTORY IS PLANNED FOR ARGENTINA

Directors of the Firestone Tire & Rubber Company on November 2 indicated their belief in the speedy return of prosperity by declaring the regular quarterly dividend of 1½ per cent on 6 per cent cumulative preferred Series A stock and authorizing the immediate construction of a new tire factory in the Argentine with a capacity of 1,000 tires and tubes daily.

The dividend will be payable December 1 to stock of record November 15.

Decision to establish a Firestone plant in the Argentine came after a favorable recommendation by Harvey S. Firestone, Jr., vice-president of the Firestone company, who recently concluded a twelve-week trip to South America.

Firestone officials also announced that owing to business increase the size of the Firestone Service Stores, Inc., service station at Miami, Fla., which is said to be one of the finest in the entire south, is to be enlarged by a new annex that will increase its floor space by 5,000 square feet. The station now covers an entire city block.

The Firestone battery plant here, which was started about two years ago and employs between 350 and 400 men, is reported operating at capacity to supply the service station demand for replacement automobile batteries.

Firestone officials predict that by next summer their plant will be taxed to capacity to meet the prospective automobile tire demand, particularly the demand for replacement tires.

The company's European trade has increased also, it is reported, and as a result the Firestone plant in England is being enlarged.

STARTS $1,000,000 SUIT OVER RUBBER PATENTS

John Hadfield, Akron maker of dipped rubber goods, filed a petition in common pleas court in that city on October 25 for an injunction to restrain John Gammeter, Akron inventor, the Thermal Process Company and L. E. Shunk Latex Products, Inc., from distributing royalties or profits from an invention for producing dipped rubber goods. Mr. Hadfield claims in his petition that the dipped goods process covered by the invention is worth $1,000,000 to the rubber industry.

The patent for the process in question was granted to Mr. Hadfield, according to his claim, and Mr. Gammeter assisted him in promoting it among dipped goods manufacturers. The patent was assigned to Mr. Gammeter as part of the move to realize on the invention, the petition states, and it was then disposed of to the Thermal Process Company, with which Mr. Gammeter is said to be connected, and which in turn licensed L. E. Shunk Products, Inc., to use it.

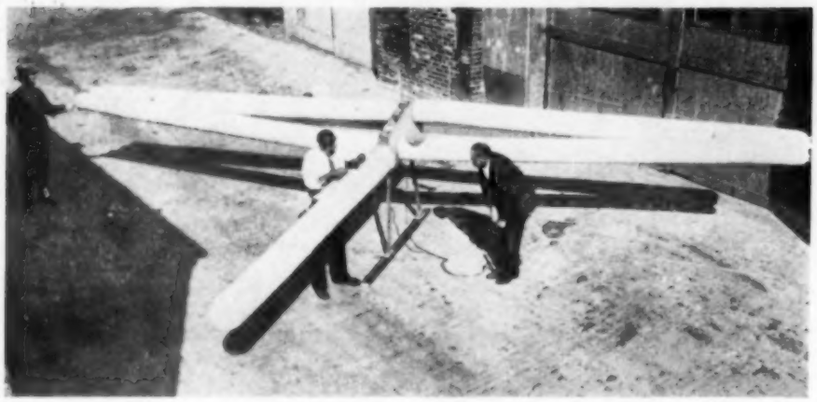
Mr. Hadfield asks for an accounting of royalties and profits derived from the use of the process and requests that a receiver be appointed to collect the royalties he claims are due him.

HANSON FISK SALES HEAD; NEW LINES ARE PLANNED

H. C. Hanson, prominent member of the sales force of the Fisk Rubber Company for many years, has been appointed general sales manager of the company, it has been announced. Mr. Hanson, was in charge of the manufacturers' sales division for a number of years, and was made acting general sales manager upon the resignation of Charles M. Piper, a few months ago. Officials of the company declined to verify a report that the company is completing plans for the development of a line of rubber accessories for the home, and that these will soon be introduced to the public.

Whether the new line, said to embrace various novelties, will be put on sale in conjunction with tires in the retail stores and roadside stations where Fisk tires are retailed, or will be merchandized through other channels, cannot be ascertained. Considerable interest attaches to the plan, however, inasmuch as, contrary to the policy of certain other tire manufacturers, the Fisk Company heretofore has stuck strictly to tires and tubes and kept out of the manufacture of other rubber goods.

Inventor Builds Glider With Rubber Frame



WHAT is termed a "pneumatic glider" has now been practically completed by Taylor McDaniel, engineer of Washington, D. C. All its wing spars, ribs and longerons are of rubber tubes inflated with air and the entire skeleton is covered with fabric, there being nothing splinterable on the glider except the landing skid and the pilot's seat. The tubes are made of two thicknesses of rubber, wrapped with seven thicknesses of parachute cloth. Those forming the wing spars are 10 inches in diameter, and there are six spars set in tripod fashion. Thus the wing at the centre is 20 inches thick, tapering to 10 inches at the end. It has a span of 26 feet and chord of six feet. The wing has 12 ribs.

According to the inventor's original plans, the tail spar tubes, when pumped tight, will bear a weight of 4,480 pounds, hung on end, without bending. Control will be gained by warping the trailing edges instead of by ailerons. The glider, when deflated, can be folded up into a three by five foot box, the entire device weighing less than 75 pounds, but it is claimed to have a considerable factor of safety in the event of a crash. Mr. McDaniel estimated its cost of construction at $200.

Kelly-Springfield Sales Gain

Sales of tires by the Kelly-Springfield Tire Company were 26 per cent higher during September than in the same month last year. The company's new Lotta Miles casing is contributing heavily to the increased sales totals.

The Harshaw Chemical Company opened Detroit offices on October 15 at Central Detroit Warehouse, Fort at 10th Streets, in that city. R. R. Davies is in charge of the new offices.

CLYDE E. SCHETTER, of the Goodyear Tire & Rubber Company publicity department, left Akron on October 28 for the south, where he will arrange operations of Goodyear blimps this winter. He will be in Richmond, Va., for nearly a month and then will go to either Miami or St. Petersburg, one of which cities will be the base of the blimp operations until next spring.

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WILLARD DOW WILL HEAD DOW CHEMICAL COMPANY

At a special meeting of the board of directors, October 21, Willard H. Dow was appointed president and general manager of the Dow Chemical Company, Midland, Michigan, to succeed Dr. Herbert H. Dow, deceased.

Many of the research activities of the organization which Mr. Dow heads have been directed towards new processes for the manufacture of carbon tetrachloride and carbon bisulfide for use in the production of rubber goods.

For eight years Mr. Dow has been a member of the board of directors, and for the past four years acted as assistant general manager. For three years he has also been assistant treasurer. His intimacy with organization executive policies strengthened by eleven years of practical chemical experience fit him particularly well to head this $30,0000,000 chemical organization.

Mr. Dow is a graduate of the University of Michigan, having received a Bachelor of Science degree in Chemical Engineering from that university in 1919. His practical work in the plant has made him familiar with the manufacturing processes used in producing more than 150 chemical products. His first act under his new title was to state that "the already well defined policies of progressive research, and the building of processes well apace of the ever-changing modern demands will, I am sure, continue to be the distinguishing factor in the Dow Chemical Company of the future."

COLUMBIAN COMPANY CUTS OUTPUT OF CARBON BLACK

The Columbian Carbon Company's estimate of its output for 1930 shows an increase in gasoline and natural gas but a decrease in carbon black and other pigments from 1929. Columbian's production of carbon black this year will approximate 100,000,000 pounds, compared with 104,855,183 pounds in 1929, while its output of other pigments will amount to 15,000,000 pounds, against 17,487,437 pounds last year.

With tire manufacturing operations at a low rate, large stocks of carbon black have accumulated, which has had its effect on prices. The bulk price generally quoted on carbon black f.o.b. Texas points is now 4 cents a pound, having been reduced a half-cent at the end of September, whereas at this time last year the quotation was 6 cents.

RUBBER STOCKS FIRMER AFTER MAKING NEW LOWS

Although eight common and preferred stocks of rubber manufacturing companies registered new lows during the past fortnight, the list closed the period steadier than two weeks ago and slightly higher. Goodyear common touched a new bottom at 35⅛, while the preferred issue fell to 78¾, both recovering part of their losses in the closing days. Other new lows were recorded by Falls, Faultless, General, Mohawk, Raybestos-Manhattan and Goodrich preferred.

Although American Hard Rubber has not recently sold on the New York Curb, it is quoted on the over the counter market at 38 bid, 43 asked, as compared with its previously recorded low of 50. Goodrich convertible 6 per cent debentures are currently selling at 72, having risen from a low of 67. Fisk 5½ per cent notes, due next January, are now selling at 21¼ and have been as low as 17. Closing prices of the securities of leading rubber companies on November 5, compared with the close on October 21 and with the high and low for the year, follow:

	Last Price		1930	
	Nov. 5	Oct. 21	High	Low
Aetna	—	—	8½	3½
Ajax	⅝	¾	2½	½
Amer. Hard Rubber	—	—	81	50
Dayton "A"	—	—	3⅞	3⅜
Falls	—	—	4⅜	1
Faultless	—	—	37	32½
Firestone	18½	15¾	33⅛	15⅜
do. 6% pfd.	59⅞	56⅛	87⅞	53⅝
Fisk	1⅛	1⅛	5½	1
do. 1st pfd.	3⅞	4½	21	2⅜
General	100	—	163	100
Goodrich	17¾	15⅝	58½	15⅛
do. pfd.	68	70	104½	67⅜
Goodyear	40	37¼	96⅞	35⅛
do. 1st pfd.	—	80	102	78¼
India	19⅞	—	25½	8½
Intercontinental	—	—	7½	2⅛
Kelly-Springfield	2	2	6⅛	1⅞
do. 6% pfd.	—	—	39	29
Lee	3⅝	3⅝	11	3½
Mohawk	—	—	16⅝	5½
do. pfd.	—	—	55	15
Norwalk	—	⅜	4	⅜
Pirelli	39½	38¼	50⅞	37½
Raybestos-Manhattan	19½	20	58⅞	19½
Seiberling	5½	—	18½	4
do. pfd.	—	—	78	30
U. S. Rubber	13	12	34	11
do. pfd.	23¼	24	63⅞	21⅛

Names in the News

E. T. Morris, advertising manager of the Pacific Goodrich Rubber Company, Los Angeles, Cal., has been transferred to Akron to assist P. J. Kelly, advertising manager of the B. F. Goodrich Company. Guy Gundaker, Jr., has been named sales promotion manager of the coast company, a new position.

B. E. Marean, first vice-president of the Electric Hose & Rubber Company, Wilmington, Del., joined the organization of the United States Rubber Company on November 1. Mr. Marean made an outstanding record in the production activities of the Electric Hose & Rubber Company, with which he was associated for a great many years.

C. B. Raymond, vice-chairman of the board of directors and vice-president of the B. F. Goodrich Company, sailed for Europe at the end of last month.

E. C. Martin, general sales manager of the Dunlop Tire & Rubber Goods Company, Ltd., presided last month at the annual sales convention of the firm's Montreal and Ottawa division, held at the Windsor Hotel, Montreal, Que. He discussed sales plans and increased selling possibilities for 1931.

Paul R. Mahony, executive vice-president of the International B. F. Goodrich Company, spoke on October 28 before a foreign trade conference of the Cleveland Export Club of the Cleveland Chamber of Commerce.

F. H. Smith, who has been with the Firestone Tire & Rubber Export Company for nearly a year, has left for India where he will represent the company at Bombay. Prior to joining the company, Mr. Smith had traveled extensively in Europe and the Far East. W. R. Faucett, who recently joined the organization after being graduated from Simpson College, has also left for India as a representative. Mr. Faucett was born in India, his father having been a missionary there for many years.

Henry F. Schippel, engineer in charge of aeronautical development for the B. F. Goodrich Company, spoke on October 27 before members of the Men's Club of the Kent Episcopal Church. He declared that rubber is bound to continue materially to advance aeronautics, citing as the latest development the experiments now being made by his department on a wing covering to eliminate ice formations.

Clifford C. Slusser, vice-president and factory manager of the Goodyear Tire & Rubber Company, was the speaker at the first of a series of six special programs for employes held at the Goodyear Theatre on October 25.

H. E. Cook, chief of the engineering department of the B. F. Goodrich Company, addressed a meeting of 250 department managers and foremen of the company at the Akron City Club on October 23. He outlined the work of the engineering department, including its recent achievement in constructing the largest refrigeration plant in Ohio in connection with the company's new wind tunnel for aviation experiments.

Colin Macbeth, well known British consulting rubber engineer, is now in the United States for a short business visit. While in New York he was a visitor to the offices of The Rubber Age. Mr. Macbeth is in the United States to promote new uses for rubber. His plans will carry him to Akron and Detroit before his return to New York.

John McKee, manager of the tire division of the United States Rubber Company branch at St. Louis, Mo., for the past 18 months, has been promoted to district manager of tire sales at the Cleveland, O., branch. He has been succeeded at St. Louis by J. P. Schiller, former Pacific coast manager for the Dayton Rubber Manufacturing Company and president of the Dayton Rubber Company of California, who has been associated with the tire trade for 15 years.

W. F. Seeger, of the Texas Carbon Industries, Inc., has been transferred from Breckenridge, Tex., to Sayre, Okla., where the company is constructing a $750,000 plant for the manufacture of carbon black and absorption of natural gasoline from gas.

F. B. Hanson, store manager for the Dunlop Tire & Rubber Company at Denver, Col., for two years, has been promoted to the position of Denver branch manager. P. M. Dean has been named by the company as division sales manager at Cleveland, O., after working with the Dunlop organization as a salesman since 1923.

Lucy M. Curtis has been appointed advertising manager of the Firestone Footwear Company, Boston, Mass. She was formerly space buyer for Daniel E. Paris, Boston advertising agent.

A. S. Stearn, who has been connected with the Ajax Rubber Company for 17 years, is now acting as special factory representative for the McClaren Rubber Company, covering New York State, with headquarters in New York City.

W. C. Young, manager of the government sales and aeronautical department of the Goodyear Tire & Rubber Company, spoke before the members of the Kiwanis Club of Dayton, O., at a luncheon meeting on October 21, his topic being 'Some Commercial Phases of Aviation." On the evening of the same day, he addressed the Dayton Engineers Club on "The Zeppelin."

H. A. Githens, former vice-president of the Federal Rubber Manufacturing Company, is now handling sales of insulated building material for the Johns-Manville Corporation at Milwaukee, Wis.

R. J. Loomis, Denver, Col., branch manager of the Pacific Goodrich Rubber Company, has been transferred to San Francisco, being succeeded at Denver by J. E. Bogue.

Gilbert J. Joint has resigned as advertising manager of the Goodyear Tyre & Rubber Company (Great Britain), Ltd., Wolverhampton, England, to take a position with Erwin Wasey & Company, Ltd., the Goodyear company's London advertising agency.

John H. Wilson, until recently New England district sales manager for the Michelin Tire Company, has just left the United States to assume the position of regional chief in England for the Michelin organization.

S. G. Carkhuff, secretary of the Firestone Tire & Rubber Company, attended the meeting of the Federal Council of Churches at Chicago, Ill., on Otober 20, 21 and 22. He went as a delegate representing both Akron, O., and near-by districts.

John J. Jordan, recently named sales manager of the Kelly-Springfield Tire Company, has also been elected vice-president and a director of the company.

John W. Boyer has resigned as vice-president of the Monsanto Chemical Works, St. Louis, Mo., effective November 1. G. Lee Camp has been elected vice-president in charge of sales by the board of directors.

A. L. Viles, general manager of the Rubber Manufacturers Association, Inc., was the principal speaker last month at the fall meeting and dinner of the Rubber Manufacturers' Association of New Jersey, held at the Trenton Club, Trenton, N. J.

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Rubber News Around the World

RUBBER INSTITUTION TO HOLD SEVERAL MEETINGS

Members of three sections of the Institution of the Rubber Industry will conduct four meetings this month, at each of which technical papers will be presented. The Midland Section will meet at the Grand Hotel, Birmingham, on November 11 to hear a paper by J. Wright on "Wheels and Rims as Applied to Transportation." A second session of this group will be held on November 25 at Wolverhampton, at which time C. P. Hawkins will talk on "The Elimination and Utilization of Waste."

The Scottish Section will meet November 12 at Edinburgh to hear a paper on "Production Economy in the Rubber Factory." The members of the Manchester Section will assemble in that city on November 20 when G. Martin, F. I. R. I., will discuss "The Evaluation of Raw Rubber."

FIRESTONE ADDS ANNEX TO ITS ENGLISH PLANT

The Firestone Tire & Rubber Company has started construction work on an annex that will add 50,000 square feet of floor space to its British plant at Brentford, England. The addition of the new structure was made necessary by the increasing demand for the company's tires in England and Europe.

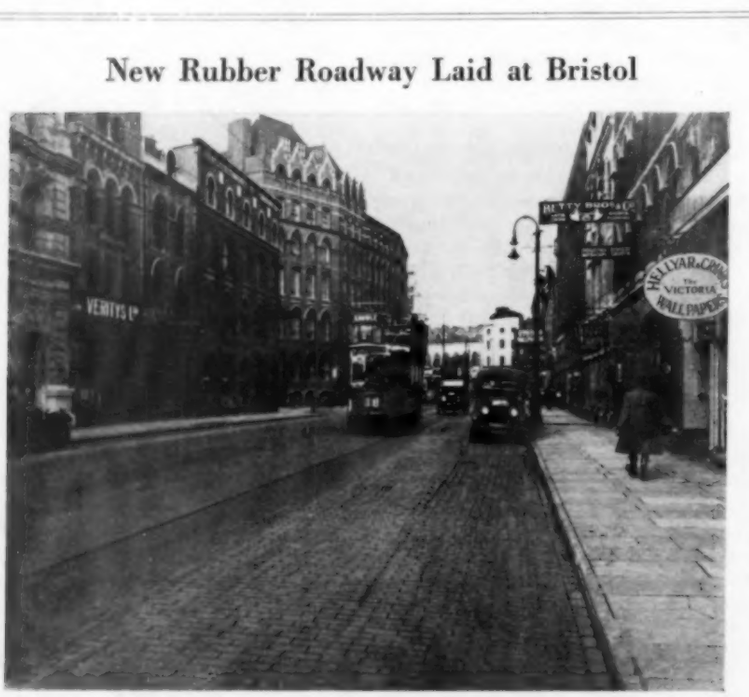
The original plant, which was built in record time between March 23 and October 16, 1928, was found to be inadequate a year after its completion. The factory and annex occupy part of a 29-acre site, situated on the outskirts of London.

TIRE INVESTMENT TRUST SHOWS HIGHER EARNINGS

Net profits of £53,844 ($269,220) are reported by the Tire Investment Trust for the year to May 31 last. This compares with £50,422 for the previous period of 15 months —or at the rate of £40,336 ($201,680) per annum — so that the past year's results show substantial improvement. Income from dividends received from tire trade investments amounted to £47,100, and including other receipts and income-tax reserve, no longer required for that purpose, there is a total of £59,667 ($298,335). Management expenses were lower, and, after adding the balance brought in, the available total is £80,122 ($400,610).

The preference dividend for the 15 months required £69,125, leaving £10,997 to be carried forward. No dividend has been paid on the cumulative preferred ordinary shares since February, 1923. Investments stand at £1,912,988 ($9,564,440), comprising 1,200,000 Ordinary Dunlop shares.

New Rubber Roadway Laid at Bristol



THIS stretch of 275 square yards of rubber roadway was recently laid along Victoria Street in Bristol, England. The blocks were supplied by the North British Rubber Company, Ltd., and the work of laying was carried out by the city. The blocks are similar in type to those laid three years ago in Buchanan Street, Glasgow, which have proved successful in heavy traffic.

AMERICAN FIRMS EXHIBIT AT ENGLISH SHOE FAIR

Several American manufacturers were numbered among the exhibitors at the annual Shoe and Leather Fair, held last month at the Agricultural Hall, London. Dewey & Almy, Ltd., subsidiary of the Dewey & Almy Chemical Company, Cambridge, Mass., displayed its Darex insulating sole, made from latex-bonded felt. Another new feature was the exhibit of Laflex, a product for insoles, middle soles, heel lifts and slipper outsoles, by the Dominion Rubber Company, Ltd., subsidiary of the United States Rubber Company.

The Dominion exhibit also showed both style and utility Wellingtons for women and children, Uskide soling material, overshoes, footholds, snow boots, and the Devart gaiter with its basket weave pattern, cleverly concealed automatic fastener and elastic stockinette lining. The Panther Rubber Company had on view its Panco soles, soling material and heels in a variety of styles and shapes.

British manufacturers had on display all the important items in their lines, including many new numbers. The Leyland & Birmingham Rubber Company showed a new sports shoe with a molded galosh and invisible stitches, while the North British Rubber Company exhibited its Scotia molded sports shoe, molded under heavy pressure by means of compressed air. The Sipaca firm of Brussels displayed rubber sandals molded in a single piece. The Rubber Growers' Association, Inc., featured crepe soled footwear for all occasions.

Graesser-Monsanto Bulletins

The Graesser-Monsanto Chemical Works, Ltd., has begun the issuance of a series of 16- to 24-page bulletins on its products and facilities for the rubber industry. The first describes with detailed illustrations the company's new rubber laboratory at its plant at Ruabon, North Wales. The second is on the subject of "Pneumatic Tire Treads" and discusses cracking in service and compounding, while the third, entitled "Softeners for Rubber," describes the company's products, Tackol, Cycline and A-510. The Graesser-Monsanto Chemical Works, Ltd., is the British affiliate of the Monsanto Chemical Works, St. Louis, Mo., and manufactures or distributes the products of the latter's subsidiary, the Rubber Service Laboratories Company, Akron, O.

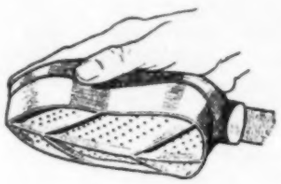
Reliance Rubberware Sale

The plant and machinery of Reliance Rubberware, Ltd., were sold at auction on November 5 and 6. The company went into receivership several months ago after attempting unsuccessfully to establish a chain of retail rubber goods establishments together with its manufacturing business.

Rubber Goods and Specialties

John Bull Car-Washing Sponge

Intended for the car owner, the John Bull car-washing sponges are especially adapted for ease and facility. They have an outer shell of soft red rubber perforated to allow a constant flow of water, the interior being filled with sponge. It can be used with or without a hose connection. It is manufac-

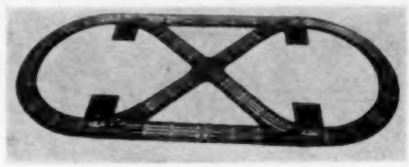


tured by the Leicester Rubber Company, Ltd., Evington Valley Mills, Leicester, England, and sells in that country for 2s 6d or for 4s 6d complete with six feet of rubber hose.

Dot Weatherstrip

Dot weatherstrip, offered by Freydberg Brothers, Inc., 19 West 19th street, New York City, is made of du Pont rubber with high grade cotton cord used in the filling as an insulation. The whole weatherstrip is finished off by having the flange doubly stitched to resist wear. Considerable technical research and development work has been done toward producing rubber that will have a maximum resistance to oxidation at

the rubber plant of E. I. du Pont de Nemours & Company at Fairfield, Conn., and the compound prepared for this weatherstrip is said to have the longest possible life under the conditions to which it is exposed. At specific intervals along the tacking lap there are dots to indicate to the user exactly where the tack is to be applied. Dot weatherstrip is packed 500 feet to the reel, each reel being mounted on a bright red display stand.



Toy Train Track-Bed

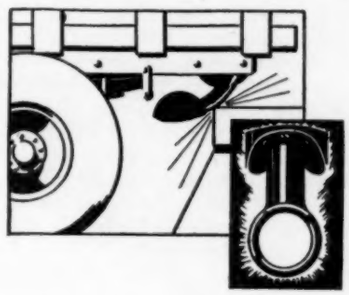
Under the name of Silent Track-Bed, Mark Harris, 215 Fourth Avenue, New York City, is marketing a new accessory to toy railroads. This track-bed is made of a fine quality rubber, finished in a natural grey color in exact representation of a rock-ballasted railroad bed. The resiliency of the rubber gives a smooth riding surface, which eliminates noise when the toy trains are in operation. It also safeguards against short circuits. The track-bed is sold in various types of sections to correspond with the track sections made by the toy train manufacturers. Eight curved sections make a complete circle, and there are also special switch sections, cross-over sections, etc.

Colorbrite Rubber Bands

Eberhard Faber, Newark, N. J., has introduced a novelty in rubber bands by packing an assortment in which bands of different lengths are colored in distinctive shades. The bands are in four sizes, ranging from an inch and a quarter to three inches in length, and are colored yellow, green, red and blue. The attractive carton has samples of the four sizes attached to its top cover, so that the user can tell at a glance what size he requires and can then select his size instantly by its color. The distinctive colors can also be used to distinguish various sets of papers or other materials that are similar in appearance.

Rubber Tail Lamp

The Champion Rubber Lamp Company, Inc., New York City, is marketing the Bull tail lamp, which is claimed to be unbreakable and weatherproof. Because the bulb is hung loosely in the lamp, surrounded by



rubber and cushioned by a light spring, it is said by the manufacturer to be entirely unaffected by vibration. It is particularly adapted for motor trucks that must undergo considerable rough driving.

Acushnet Handles Watch Holder

The manufacture and marketing of the molded rubber watch container introduced by the I. B. Kleinert Rubber Company has been taken over by the Acushnet Process Company, New Bedford, Mass. This item, which is made in attractive colors to hold a standard size watch, was described and illustrated on page 93 of the October 25th issue of THE RUBBER AGE.

New Models of German Rubber Rainwear

GERMAN manufacturers have introduced a variety of new styles in waterproof clothing for the coming year, including many innovations for men, women and children. The styles shown above are representative of the types that are expected to be popular in that country during 1931.

Current Crude Rubber Items

LIBERIA ENDS SLAVERY AFTER LEAGUE INQUIRY

All the domestic slaves of the native tribes have been declared free by the Liberian government, and the country has also abolished the system by which a tribesman pledged a member of his family as security for a loan and has ended the forced recruiting for labor contracts on rubber plantations and other foreign concessions.

Liberia explained its action was taken because of the report of the international inquiry commission, which found these forms of slavery still existing there. The report, which the Liberian government received in September, has not yet been released from Geneva. The inquiry commission was composed of Dr. Charles Johnson, appointed by the United States; Cuthbert Christy of Great Britain, appointed by the League Council, and Sir Arthur Barclay, named by the President of Liberia.

MALAYAN COURT UPHOLDS PATENTS FOR REVERTEX

Dr. Ernst A. Hauser and M. S. Stutchbury, patentees of the Revertex process, have by an action brought before the Supreme Court at Ipoh, F. M. S., succeeded in having revoked the Singhen patents for "improvements in the art of concentrating rubber latices and the products thereof." The patents in question, granted to Veera Kumar Singhen, engineer, inventor and journalist, in 1927 and 1929, were said to have been preceded by the Hauser-Stutchbury patent of 1924.

The court found that the Singhen patent was invalid because it was not a new invention and because it did not specifically describe any actual process.

Producers Agree to Allot Part of Output to Roadways

SEVERAL thousand tons of crude rubber will be set aside for use for rubber roadways under a plan adopted last month by the Council of the Rubber Growers' Association, Inc., and published in the form of an appeal to its membership. The plan, originally drawn up by Rubber Roadways, Ltd., an organization formed 15 years ago under R. G. A. auspices, provides for the contribution of a certain amount of estate production for this purpose free and further amounts at stipulated maximum prices for a period of five years.

The Rubber Growers' Assoociation has now published the details of the plan in a memorandum, which says that progress made in regard to production costs is most encouraging. Having regard to the advantages of rubber roadways, the board thinks that the placing on the market of a material at a competitive price will create a permanent new industry which will absorb large quantities of crude rubber annually—an important matter to growers.

Technical Research Is Necessary

The board feels confident that the commercial development of rubber roadways will be greatly stimulated by (1) further technical research, (2) subsidies of crude rubber, and (3) financial assistance.

Technical research would comprise investigation of a standard specification or tests for rubber road surfaces to suit varying conditions of traffic, inquiry into thickness of foundations, methods of laying, the compilation of data for the information of road engineers.

"Rubber at a stable price is of vital importance in the initial years of commercial development," says the memorandum, "and growers have everything to gain by joining in some scheme for the appropriation of a small percentage of their crops over a period of years.

"It has been suggested that growers should have their own factory for the manufacture and marketing of rubber road blocks. This is a matter somewhat outside the functions of producers, but the question of financial assistance for the provision of plant and machinery with the object of expediting the manufacture of blocks should receive favorable consideration. This would encourage manufacturers to deal with rubber blocks as a definite branch of their business, and, with subsidies of rubber the growers would necessarily have a voice in marketing policy.

"Encouragement should also be given to pooling of operations so that any type of block required by a road authority could be speedily turned out in quantity."

The R.G.A. Council has adopted the memorandum, and decided to make an immediate appeal to producers to agree to supply to Rubber Roadways, Ltd., standard quality rubber for a period of five years on the following basis:

In each of the five years an amount not exceeding the equivalent of

(1) One-half of 1 per cent of their 1929 crops free.

(2) One per cent of their 1929 crops at market price ruling on date of delivery, or 6d. per pound, whichever is lower.

(3) One per cent of their 1929 crops at market price ruling on date of delivery or 9d. per pound, whichever is lower.

It is proposed that the rubber will be called up when required, and that it will be devoted to the manufacture of, or experiments connected with, rubber roadways and to cognate purposes, and will not be realized for the purpose of providing funds.

To Appeal to Dutch Growers

It is also intended that assents to the scheme shall not be binding unless producers representing a production during 1929 aggregating not less than 150,000 tons have agreed to contribute rubber on the basis outlined. The appeal is addressed to all producers domiciled in the United Kingdom, also to local companies and proprietors, and large Asiatic proprietors. Dutch and other continental producers are being approached through the International Association for Rubber and other Cultivations in the Netherlands Indies, The Hague.

Closing Prices on Rubber Exchange of New York, Inc.

FROM OCTOBER 20 TO NOVEMBER 3, 1930

		Spot	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Sales
No. 1 Standard Contract of 10 Tons															
Oct.	20	8.25	8.37	8.45	8.58	8.71	8.84	8.95	9.05	9.14	9.23	9.38	9.52	——	56
	21	8.25	8.15	8.32	8.44	8.56	8.68	8.77	8.85	8.95	9.04	9.14	9.24	——	65
	22	8.12	8.00	8.12	8.26	8.33	8.41	8.52	8.62	8.72	8.81	8.95	9.05	——	56
	23	8.32	8.30	8.45	8.57	8.68	8.80	8.90	9.00	9.10	9.20	9.30	9.40	——	18
	24	8.62	8.60	8.67	8.80	8.92	9.05	9.15	9.25	9.33	9.40	9.52	9.63	——	140
	25	9.00	8.82	8.92	9.10	9.23	9.35	9.43	9.50	9.62	9.73	9.85	9.97	——	95
	27	8.75	8.56	8.66	8.80	8.93	9.06	9.13	9.15	9.25	9.35	9.47	9.60	——	81
	28	8.75	8.68	8.75	8.90	9.05	9.20	9.25	9.30	9.40	9.49	9.60	9.70	——	55
	29	9.25	8.95	9.15	9.32	9.41	9.50	9.58	9.65	9.75	9.85	9.92	10.10	——	221
	30	9.00	8.90	9.00	9.12	9.22	9.35	9.43	9.50	9.60	9.70	9.83	9.95	——	62
	31	8.75	8.80	8.85	8.95	9.04	9.13	9.19	9.25	9.35	9.45	9.55	9.65	——	113
Nov.	1	8.70	8.50	8.61	8.80	8.90	9.05	9.13	9.20	9.30	9.40	9.50	9.60	9.72	15
	3	8.25	8.28	8.35	8.48	8.61	8.74	8.82	8.90	9.00	9.10	9.23	9.35	9.48	95
"A Contract of 2½ Tons															
Oct.	20	——	8.30	8.40	8.50	8.60	8.70	8.80	8.90	9.00	9.20	9.30	9.40	——	142
	21	——	8.00	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.80	8.90	9.00	——	159
	22	——	7.90	8.00	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.90	9.00	——	201
	23	——	8.20	8.30	8.50	8.60	8.70	8.80	8.90	9.00	9.10	9.20	9.30	——	136
	24	——	8.50	8.60	8.70	8.80	8.90	9.00	9.10	9.20	9.30	9.40	9.50	——	159
	25	——	8.70	8.80	9.00	9.10	9.20	9.30	9.40	9.50	9.60	9.70	9.80	——	154
	27	——	8.50	8.60	8.70	8.80	8.90	9.00	9.10	9.20	9.30	9.40	9.50	——	157
	28	——	8.50	8.60	8.80	8.90	9.00	9.10	9.20	9.30	9.30	9.40	9.50	——	139
	29	——	8.90	9.00	9.20	9.30	9.40	9.50	9.50	9.60	9.80	9.90	9.90	——	188
	30	——	8.80	8.90	9.00	9.10	9.20	9.30	9.40	9.50	9.70	9.70	9.80	——	78
	31	——	8.70	8.80	8.90	8.90	9.00	9.10	9.20	9.20	9.40	9.40	9.50	——	251
Nov.	1	——	8.40	8.50	8.70	8.80	8.90	9.00	9.10	9.20	9.30	9.40	9.50	9.60	13
	3	——	8.20	8.30	8.40	8.50	8.60	8.70	8.80	8.90	9.00	9.10	9.30	9.40	159

GOODRICH BRANCH HEADS HOLD AKRON CONFERENCE

Policies for 1931 were adopted by branch managers of the B. F. Goodrich Rubber Company from throughout the country at a recent conference held in the company's main offices in Akron, O.

Experience gained by entrance of the company in the retail field through its retail stores, Goodrich Silvertown, Inc., will be used as a foundation for the selling program for dealers next year.

While in Akron the representatives heard department heads and officials of the Goodrich company discuss many phases of tire, mechanical goods and accessory manufacture and inspected the entire plant to become more definitely acquainted with the methods of manufacture and the recent developments in the industry.

Results of actual road tests of the Silver Fleet, the Goodrich test car group which has seen service over all types of roads throughout the country, were among the observations of the managers.

Meriam Company is Busy

The Meriam Company, manufacturers of manometers, flow meters and draft gauges at Cleveland, O., is enjoying better than normal business, its sales of instruments in September and October breaking all previous records during the past 15 years. J. B. Meriam, president, attributes this to the current need for lower production costs in industry through more exact measurement of the flow and pressure of fluids handled in pipe-lines.

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French Cotton Men in Akron

Prominent French cotton manufacturers visited Akron on October 21 and inspected the factories of the B. F. Goodrich Company. The manufacturers, making a tour under the auspices of the Confederation Generale de la Production Francais, included representatives of all the leading cotton mills of France.

India Tyre Subsidiaries

The India Tyre & Rubber Company (Great Britain), Ltd., has begun preparations for an expansion of its sales activities through England by the formation of 18 subsidiary organizations to act as regional distributors of its products. Each of the new subsidiaries has been registered as a private company under the name of India Super Tyres, Ltd., together with the name of the locality in which it is to operate. The nominal capital specified for each organization varies from £500 to £2,500 in 1s. shares.

Pioneer Force Increased

Increase in export orders and domestic business has caused the Pioneer Rubber Company to open its plants at Willard and Attica, O., to full time, with the addition of a force of girls for night work in the Willard plant. Nearly 200 employees are now on the payroll, bringing the force to a point almost as high as at any time since the establishment of the factories.

Pass Montgomery Ward Dividend

Directors of Montgomery Ward & Company, Chicago mail order and chain store firm, have voted to omit the dividend of 75 cents a share due on the common stock at this time in order to conserve the company's resources for future development of the business. The company, which is one of the leading distributors of automobile tires in the country, has operated at a loss of $2,848,000 for the first nine months of 1930.

M. E. A.—N. S. P. A. Shows

The Motor and Equipment Association and the National Standard Parts Association will hold their annual conventions during the same week and will conduct a joint trade show for the first time at the Cleveland Public Auditorium from November 13 to 19. Several rubber manufacturers are among the membership of these organizations.

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U. S. TO AID DEALERS IN ESTABLISHING STATIONS

Enlarging the scope of its tire repair school and repair material and accessory division, the tire department of the United States Rubber Co., Detroit, has instituted a complete service plan to assist its dealers in establishment of a service station or enlargement of present facilities.

This department will provide dealers with detailed plans for a service station, based on rough sketches and descriptions supplied by the dealer. Factory experts trained in service department operation and construction then will supply complete architects' plans, showing how the machinery should be spotted for the most economical operation. Through the company's purchasing department, arrangements then will be made for the purchase of machinery through the most advantageous arangements possible.

If necessary to train men in operation of vulcanizing and other machinery, arrangements will be made through this department for the schooling of the men at the company's school in Detroit.

INTERNATIONAL RUBBER BUILDING NEW FACTORY

Contracts are about to be awarded for the construction of a modern factory building at Pueblo, Col., to house the International Rubber Company. New machinery to be installed in the factory will be purchased so as to arrive by the time the building is completed, and machinery and equipment from the company's Denver plant will also be moved to Pueblo.

The Denver plant has begun operations on a 24-hour basis, so as to insure an adequate stock on hand during the removal to the new factory. An extensive campaign to increase the trade territory served by the company is meeting with success, according to R. C. Sudbury, president.

Monobloc Factory Auction

Total proceeds of the sale of machinery and equipment of the Monobloc Company plant at New Philadelphia, O., on October 27 and 28 were $85,088, of which $70,000 was paid by the Cleveland Trust Company, a creditor. Several items of rubber machinery were among the equipment sold by the Industrial Plants Corporation as auctioneer. There were 360 bidders present. The building is owned by the Houk Rubber Company, Cleveland, O.

United Rubber Machinery Busy

Despite prevailing reports of business depression in the rubber industry, the United Rubber Machinery Exchange, 319 Frelinghuysen Avenue, Newark, N. J., reports that for the past several months conditions have been found very satisfactory. This firm has in that time dismantled a number of rubber factories, whose equipment has been rapidly disposed of to other rubber manufacturing plants.

LATE MARKET PRICES

RUBBER—COTTONS AND FABRICS—CHEMICALS

NEW YORK, NOVEMBER 5, 1930

RUBBER

Crude

THE market price for crude rubber during October fluctuated over practically the same range as in September, and the average of the daily closing prices at New York and London was almost exactly the same in both months. The average closing price for spot ribbed smoked sheets on the New York outside market in October was 8.20 cents a pound as compared to 8.28 cents in September and to 19.67 cents in October, 1929.

Rubber opened the month at its low of 7½ cents a pound, ran up to a high point of 9⅛ cents on October 29, and has since dropped back to 8⅜ cents. One explanation of the sudden flurry that sent the price up is that there was considerable buying of spot rubber for French account, owing to rumors that the French government proposed an import duty on all rubber not produced in the French colonies. This report now appears to be unfounded, but London in the week ended November 1 saw the heaviest total of deliveries in many months. Another rumor was that an important Chinese merchant in Singapore was in difficulties, which led British and American dealers involved to partly cover as a precautionary measure.

Prices quoted on the New York outside market on November 5 were as follows:

Plantations—

Ribbed Smoked Sheets—			
Spot-Nov.	.08¼	@	.08½
Dec.	.08¼	@	.08½
Jan.-Mar.	.08⅝	@	.08⅞
First Latex, crepe spot	.08¼	@	.08½
Amber Crepe, No. 2	.08	@	.08¼
Amber Crepe, No. 3	.07⅞	@	.08¼
Amber Crepe, No. 4	.07¼	@	.07½
Brown Crepe, Clean thin	.07¾	@	.08
Brown Crepe, specky	.07⅝	@	.07⅝
Liquid Latex, per gal.	.75	@	.85

Paras—

Up-river Fine	.12	@	.12¼
Up-river Medium	Nominal		
Up-river Coarse	.07	@	.07¼
Acre Bolivian, fine	.12	@	.12¼
Caucho Ball, Upper	.07	@	.07¼
Islands, fine	Nominal		

Centrals—

Central, scrap	—	@	.07
Esmeraldas	—	@	.07

Balata—

Block, Colombia	Nominal		
Block, Ciudad	.34	@	.35

LONDON MARKET

Standard Ribbed Smoked Sheets—Buyers

Spot-Nov.	—	@	4¼d
Dec.	4⅛	@	4¼d
Jan.-Mar.	4⅛	@	4⅜d

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—Sellers

Spot		@	3⅞d

Scrap

The scrap rubber market has remained as quiet as in the past two months, deliveries being slight and collections difficult. The turn of the year is expected to bring the long hoped for increase in business, but until then the scrap market is apparently to remain in a state of comparative idleness. Late prices for the various grades of rubber scrap are as follows:

(Prices to Consumer)

Auto tire peelings	ton	23.50	@	25.00
Mixed auto	ton	12.00	@	12.50
Bicycle tires	ton	9.00	@	10.00
Clean solid truck tires	ton	24.50	@	26.00
Boots and shoes	cwt.	1.10	@	1.25
Arctics, untrimmed	cwt.	.90	@	1.00
Inner tubes, No. 1	lb.	.05¼	@	.05½
Inner tubes, No. 2, compounded	lb.	.02⅛	@	.02¼
Inner Tubes, Red	lb.	.02¼	@	.02⅝
Air Brake Hose	ton	10.00	@	12.00
Rubber Hose	ton	9.00	@	10.00

Reclaimed

Stocks of reclaimed rubber in the United States are now near the point where they would not satisfy a normal month's requirements. If, as is expected, tire manufacturing and the general industry picks up sharply after the end of the year, the demand for reclaim may be greater than can be easily met. Late prices for the different grades follow:

High Tensile

Super-Reclaim Black	lb.	.08½	@	.08¾
High Tensile Red	lb.	.08¼	@	.08½

Shoe

Unwashed	lb.	.06	@	.06¼
Washed	lb.	.08	@	.08¼

Tube

No. 1 (Floating)	lb.	.08½	@	.08¾
No. 2 (Compounded)	lb.	.07½	@	.07¾

Tires

Black	lb.	.05¾	@	.06
Black, selected tires	lb.	.06	@	.06½
Dark Gray	lb.	.07	@	.07½
Light Gray	lb.	.07¾	@	.08
White	lb.	.08¾	@	.09
Truck, Heavy Gravity	lb.	.06	@	.06¼
Truck, Light Gravity	lb.	.06¼	@	.06½

Miscellaneous

Mechanical blends	lb.	.05	@	.05½

COTTON and FABRICS

Cotton

DURING the month of October the average of the daily closing prices for spot middling upland cotton has been 10.63 cents a pound, as compared with 10.85 cents in September and with 18.46 cents in October, 1929. The last week of the month saw an appreciable advance due to the broadest buying movement that has been in evidence for a long time, but subsequent reactions have brought the price back under the 11-cent level.

How drastic the curtailment of domestic mill activity has been is indicated by the figures of the Association of Cotton Textile Merchants of New York, showing that the production of cotton cloth in the first nine months of 1930 was 1,539,763,000 yards less than in the corresponding period of last year.

The high, low and closing prices on the New York Cotton Exchange on November 5 were as follows:

	High	Low	Close Nov. 5	Close Oct. 21
Dec.	11.11	10.83	10.89	10.50
Jan.	11.12	10.98	11.07	10.64
Mar.	11.50	11.24	11.30	——

Tire Fabrics

Consumption of cotton fabric in the tire industry during September and October was at the lowest point for the entire year, and November thus far has shown no indication of picking up to an appreciable extent. Late prices for the various grades follow:

CORD

Peeler, carded, 23/5/3	lb.	.36	@	.36¼
Peeler, carded, 23/4/3	lb.	.38	@	.38¼
Peeler, carded, 13/3/3	lb.	.33½	@	.33¾
Peeler, carded, 15/3/3	lb.	.34	@	.34¼
Egyptian, carded, 23/5/3	lb.	.45	@	.45½
Egyptian, combed, 23/5/3	lb.	.51	@	.51½

CHAFERS

Carded, American, 8 oz.	lb.	.29	@	.29½
Carded, American, 10 oz.	lb.	.28½	@	.29
Carded, American, 12 oz.	lb.	.27½	@	.28½
Carded, American, 14 oz.	lb.	.26	@	.27

LENO BREAKER

Carded, American, 8¼ oz.	lb.	.28	@	.33
Carded, American, 10¼ oz.	lb.	.28	@	.33

SQUARE WOVEN

Carded, American, 17¼ oz. 23-11 ply	lb.	.36	@	.36½
Carded, American, 17¾ oz. 10-ply	lb.	.26	@	.26½

Sheetings

Practically all sizes of sheetings showed a quarter of a cent price increase at the end of the fortnight. Latest prices, as reported by the Textile Brokers Association, follow:

40-inch, 2.50-yard	yd.	.08⅝	@	.08¾
40-inch, 2.85-yard	yd.	.07⅝	@	.07¾
40-inch, 3.15-yard	yd.	—	@	.08½
40-inch, 3.60-yard	yd.	—	@	.07⅞
40-inch, 3.75-yard	yd.	.06¼	@	.06⅜
40-inch, 4.25-yard	yd.	.05⅝	@	.05¾

Ducks

The market for cotton ducks has been quiet during the fortnight, with the reduced prices of late October still prevailing. The current price quotations for the various grades are as follows:

Belting and Hose	lb.	.25	@	.26
Enameling	lb.	.28	@	.31
Single filling	lb.	.11½	@	.12½
Double filling	lb.	.13	@	.14

CHEMICALS

WITH tire production and crude rubber consumption at their lowest levels for the year during the past two months, there has been no heavy demand for rubber chemicals and compounding ingredients. Several manufacturers, however, have begun placing contracts for at least a part of their winter and spring requirements, and this has kept the sales forces of rubber chemical suppliers fairly busy. Predictions by economists that a tire shortage is in the making have been confirmed by statements of the representatives of several leading manufaturing companies. A decided pick-up seems likely, therefore, by the turn of the year, if not earlier.

ACCELERATORS

Organic				
A-1	lb.	.24	@	.27
A-5-10	lb.	.33	@	.36
A-7	lb.	.55	@	.59
A-11	lb.	.62	@	.66
A-16	lb.	.57	@	.61
A-19	lb.	.58	@	.62
A-20	lb.	.64	@	.68
A-32	lb.	.80	@	.95
Aldehyde ammonia, crystals	lb.	.65	@	.70
Aniline oil, drums, f.o.b. works	lb.	.15	@	.16
Captax	lb			
Crylene	lb.	.55	@	.65
paste	lb.	.45	@	.55
Di-Ortho-Tolyguanidine	lb.	.42	@	.44½
Diphenylguanidine	lb.	.30	@	.32½
Dipsol	lb.	4.30	@	4.50
Ethylidene aniline	lb.	.45	@	.47½
Formaldehyde aniline	lb.	.37½	@	.40
Heptene	lb.	.40	@	—
Hexamethylene-tetramine	lb.	.58½	@	.61
Lithex	lb.	.18	@	.20
Methylenedianiline	lb.	.37½	@	.40
Monex	lb.	3.25	@	--
Oxynone	lb.	.68	@	.80
Phenex	lb.	.75	@	—
R & H 40	lb.	.40	@	.42½
R & H 50	lb.	.40	@	.42½
R & H 397	lb.	.75	@	.77½
R-2	lb.	1.95	@	2.15
Safex	lb.	1.20	@	1.25
SPDX	lb.	.75	@	—
Super-Sulphur No. 1	lb.			
No. 2	lb.			
Tensilac, No. 39	lb.	.40	@	.42½
Tensilac, No. 41	lb.	.50	@	.52½
Thermio F	lb.	.50	@	.55
Thiocarbanilid, drums	lb.	.25½	@	.28½
Trimene	lb.	.75	@	—
base	lb.	1.20	@	—
Triphenylguanidine	lb.	.58	@	.62½
Tuads	lb.			
Ureka	lb.	.75	@	1.00
Vulcanex	lb.			
Vulcone	lb.			
Vulcanol	lb.			
Z-88-P	lb.	.50	@	.60
Zimate	lb.			
Inorganic				
Lead, sublimed blue	lb.	.08¼	@	—
Lead, white	lb.	.08½	@	.08¾
Litharge, domestic	lb.	.07¾	@	—
Magnesia, calcined, light	per 100 lb.	5.35	@	5.45
heavy	per 100 lb.	3.65	@	3.75

COLORS

Blacks (See Compounding Materials)				
Blues				
Prussian	lb.	.35	@	.36
Ultramarine	lb.	.06	@	.32
Browns				
Sienna, Italian	lb.	.05½	@	.12½
Umber, Turkey	lb.	.04½	@	.07
Greens				
Chrome, light	lb.	.30	@	.32
medium	lb.	.31	@	.33
dark	lb.	.34	@	.36
Chromium Oxide, bbl.	lb.	.34½	@	.35½
Reds				
Antimony crimson, 15/17	lb.	.40	@	.44
sulfur, free	lb.	.56	@	.66
golden, 15/17 F.S.	lb.	.20	@	.25
Indian English	lb.	.08	@	.11
Domestic (Maroon)	lb.	.11	@	—
Oximony	lb.	.13¼	@	—
Red oxide, pure	lb.	.10	@	.12
Smith's 444 Crimson f.o.b. Springfield	lb.	.08¾	@	.10
Rub-Er-Red, f.o.b.Easton	lb.	.08¾	@	—
Venetian red	lb.	.08	@	.06
Vermillion, quicksilver, English	lb.	1.75	@	1.80
Whites				
Lithopone, Akcolith	lb.	.05 3/5	@	.06
Lithopone, Albalith	lb.	.05¼	@	.05¾
Lithopone, Azolith	lb.	.05¼	@	.05¾
Lithopone, Vanolith	lb.	.05¾	@	—
Titanox B, f.o.b. St. Louis,	lb.	.07¼	@	.07¾
Titanox C, f.o.b. St. Louis,	lb.	.07¾	@	.08¼
Zinc Oxide—American Process				
American Azo:				
ZZZ (lead free)	lb.	.06½	@	.07
ZZ (leaded)	lb.	.06⅞	@	.06⅞
Horsehead Brand:				
Special	lb.	.07	@	.07½
XX Green	lb.	.07	@	.07½
XX Red, lead free	lb.	.06½	@	.07
Kadox, black label	lb.	.10⅜	@	.10⅞
blue label	lb.	.09⅜	@	.09⅞
red label	lb.	.08	@	.08½
Zinc Oxide—French Process				
White seal	lb.	.11⅝	@	.11⅞
Green seal	lb.	.10⅜	@	.10⅞
Red seal	lb.	.09⅜	@	.09⅞
Yellows				
Chrome	lb.	.17	@	.17½
Ocher, French medium	lb.	.02	@	.03
domestic	lb.	.01⅝	@	.02

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@	24.50
Ammonia carbonate, lump	lb.	.07½	@	.07¾
Asbestine	ton	14.75	@	18.00
Barium carbonate	lb.	.03½	@	.05
Barium Dust	lb.	.05	@	.06
Barytes southern off-color	ton	12.00	@	18.00
Western prime white	ton	23.00	@	—
imported	ton	27.00	@	36.00
Basofor	lb.	.04½	@	—
Bentonite	lb.	.02	@	.03
Blacks				
Arrow "Aerfloted"	lb.	.04½	@	.09½
Bone Black	lb.	.06	@	.12½
Carbon, compressed	lb.	.04	@	.08½
Carbon, uncompressed	lb.	.04	@	.08½
Disperso, f.o.b. Louisiana	lb.	.041	@	—
Disperso, f.o.b. Texas	lb.	.04	@	—
Drop Black	lb.	.06	@	.14
Fumonex	lb.	.04	@	.07½
Excello, compressed	lb.	.05	@	.09
Gastex, f.o.b. Texas	lb.	.04	@	.05¼
Lamp Black	lb.	.10	@	.40
Micronex	lb.	.04½	@	.09½
Thermatomic-Thermax	lb.			
Flex	lb.			
P-33	lb.			
United carbon, fob Tex.	lb.	.04½	@	.09½
Velvetex carbon	lb.	.03	@	.06
Blanc fixe dry f.o.b. works	ton	75.00	@	90.00
Carrara filler	lb.	.01¾	@	.02
Catalpo (fact.)	lb.	.02	@	—
Clay, Kaolin, domestic	ton	8.00	@	9.00
Aerfloted, Suprex	ton	8.00	@	20.00
Colloidal	lb.	.05	@	.08
Congaree, c. l. f.o.b. mine	ton	9.00	@	—
Dark Blue Ridge	ton			
Dixie	ton			
Langford	ton			
Lexington	ton	10.00	@	22.00
Mineral Flour, c.l. f.o.b. mine	ton	20.00	@	23.00
Par	ton			
Tensulite	ton	15.00	@	—
Glues, extra white	lb.	.22	@	.26
medium white	lb.	.20	@	.24
Magnesia, carbonate	lb.	.08¾	@	.11
Mica, white water grnd.	lb.	.06	@	.08
Off color (biotite)	lb.	.05	@	.07
Rotten Stone (powdered)	lb.	.02	@	.05
Soapstone, powdered	ton	15.00	@	22.00
Starch, powdered	cwt.	3.62	@	3.92
Talc, domestic	ton	12.00	@	15.00
Pyrax A	ton			
Whiting, commercial	cwt.	—	@	1.00
English cliffstone	cwt.	1.75	@	2.00
Quaker	ton			
Superfine	ton	10.00	@	12.00
Sussex	ton			
Witco	ton	20.00	@	—
Zinc Carbonate	lb.	.09½	@	.10½
Zinc Stearate	lb.	.23	@	.24½

MINERAL RUBBER

Genasco (factory)	ton	50.00	@	52.00
Granulated M. R.	ton			
Hard Hydrocarbon	ton			
Paradura	ton	62.50	@	65.00
Parmr, solid	ton	28.00	@	48.00
Pioneer, MR, sclid	ton	40.00	@	42.00
Pioneer-granulated	ton	50.00	@	52.00
R & H Hydro-Carbon	ton	27.05	@	29.00
Robertson, MR, solid	ton	34.00	@	80.00
M.R. (gran)	ton	38.00	@	80.00

SOFTENERS

Acids				
Nitric, 36 degrees	cwt.	5.00	@	5.25
Sulfuric, 66 degrees	cwt.	1.60	@	1.95
Tartaric, crystals	lb.	.34½	@	.36
Acids, Fatty				
Laurex	lb.	.15	@	.16
Stearex	lb.	.13	@	.17
Stearic, double pressed	lb.	.17	@	.22
Alkalies				
Caustic soda, 76%	cwt.	3.76	@	3.91
Soda ash, 58% C.L.	cwt.	1.40	@	
Oils				
Corn, refined, bbls.	lb.	.08	@	.09¾
Cottonseed, crude		.07	@	.07¼
Cycline	gal.	.27	@	.34
Degras (c.l. 100 bbls.)	lb.	.03¾	@	—
Less c.l. (10-25 bbls.)	lb.	.04	@	—
Lots less than 10 bbls.	lb.	.04¼	@	.04½
Fluxrite	lb.	.05½	@	.06½
Palm Lagos	lb.	—	@	.07
Niger	lb.	.05¼	@	.05¼
Para-Flux	gal.	.17	@	—
Petrolatum, white	lb.	.08	@	.08½
Pigmentaroil	gal.	.15	@	.20
Pine, steam distilled	gal.	.65	@	.70
destructively distilled	gal.	.50	@	.55
Witco Palm Oil	lb.	.11	@	—
Witco Softener (f.o.b. wks.)	lb.	.02	@	—
Resins and Pitches				
Pitch, Burgundy	lb.	.06½	@	.07½
coal tar	gal.	.05½	@	.06
pine, 200 lb. gr. wt.	bbl.	7.00	@	—
Rosin, grade K, 280 lb.	bbl.	—	@	6.12½
Pigmentar	gal.	.16	@	.21
Tar Retort, 50 gal.	bbl.	13.50	@	15.00
Solvents				
Acetone, pure	lb.	.11	@	.12
Alcohol, denatured, No. 1 bbls.	gal.	.40	@	.44
Benzol, 90%	gal.	.21	@	.23
Carbon, biculphide	lb.	.05½	@	.06¼
Carbon, tetrachloride	lb.	.06¼	@	.07
Dryolene (f.o.b. Okla.)	gal.	.10	@	.10½
Gasoline, steel bbls.	gal.	.16	@	—
Naphtha, solvent	gal.	.35	@	.40
Rub-Sol (f.o.b. Okla.)	gal.	.09	@	—
Turpenting, spirits	gal.	.41½	@	.42
wood	gal.	.38	@	.39
destructively distilled	gal.	.34	@	.35
Waxes				
Beeswax, white	lb.	.51	@	.53
Carnauba	lb.	.30	@	.34
Ceresin, white	lb.	.10	@	.11
Montan, crude	lb.	.06½	@	.07
Ozokerite, black	lb.	.24	@	.25
green	lb.	.26	@	.30
Paraffin (c.l.—f.o.b. N. Y.)				
Yellow crude scale	lb.	.02½	@	—
White crude scale 124/126	lb.	.02½	@	—
Refined, 125/127	lb.	.03⅝	@	—
Refined, 128/130	lb.	.03¾	@	—
Refined, 135/137	lb.	.05¼	@	—
Refined, 138/140	lb.	.07¼	@	—

ANTI-OXIDANTS

Agerite, Resin	lb.			
Powder	lb.			
White	lb.			
Albasan	lb.	.70	@	.75
Antox	lb.			
B-L-E	lb.	.57	@	.60
Neozone	lb.			
Oxynone	lb.	.68	@	.80
Resistox	lb.	.54	@	.57
Stabilite	lb.	.57	@	.62
Stabilite Alba	lb.	.70	@	.75
VGB	lb.	.55	@	.66

SPECIALTIES

Sunproof	lb.	.35	@	.37½
Sponge Paste	lb.	—	@	.30
Tonox	lb.	.56	@	.60

SUBSTITUTES

Black	lb.	.08	@	.14
White	lb.	.10	@	.16
Brown	lb.	.08	@	.15

VULCANIZING INGREDIENTS

Sulfur Chloride (drums)	lb.	.03½	@	.04½
Sulfur flour, Ref'n'd, 100% pure (bags)	cwt.	2.40	@	2.75
Commercial (bags	cwt.	1.75	@	2.10
Vandex	lb.			

TIRES & TUBES
CRUDE RUBBER

STATISTICAL SECTION

AUTOMOBILES
GASOLINE

OUTSTANDING among the statistical developments of the fortnight was the sharp decline of 4,738 long tons in London warehouse stocks of crude rubber in the week between October 25 and November 1. This drop of warehouse stocks at the British capital from 82,218 long tons to 77,480 long tons came about through a combination of low arrivals and unusual high deliveries of 6,148 long tons.

Liverpool stocks, however, have continued to increase, although not sufficiently to offset the sharp decrease at London. Total British warehouse stocks as of November 1 were at 116,421 long tons as compared with the peak of 120,313 long tons on October 18. Other factors offsetting the drop in English inventories are gains in the stocks on hand in Holland and in Brazil and possibly in the United States.

Preliminary figures issued for the benefit of the National Business Survey Conference tend to show that September tire output was the lowest for the year and, with the single exception of last December, the lowest since July, 1924. October production is believed to have been even lower, with a consequent reduction in crude rubber consumption.

Latest figures covering exports and imports from the leading producing and consuming countries have been added to the appropriate tables in this section.

PLAN OF THE SECTION

The statistics included in this section have been chosen for their constant importance to the rubber industry. The tables are reprinted in the same relative position in every issue, each table being kept current by the addition of new figures as soon as they become available.

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U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Total Declared Value	Average Declared Value per pound Cents	Re-exports: Long Tons	Total Declared Value	Average Declared Value per pound Cents	Net Imports: Long Tons
1921	185,394	73,772,677	17.76	5,716	2,414,924	18.86	179,678
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1928:							
Jan.	39,107	30,278,444	34.56	1,988	1,734,990	38.95	37,119
Feb.	33,663	27,763,655	36.82	2,738	2,229,589	36.35	30,925
Mar.	40,611	32,103,042	35.29	3,718	2,587,435	31.07	36,893
Apr.	37,935	27,287,266	32.11	2,272	1,415,024	27.80	35,663
May	31,059	19,058,672	27.39	2,399	1,386,307	25.80	28,660
June	27,765	14,121,219	22.71	2,621	1,400,697	23.86	25,144
July	31,258	14,144,765	20.20	3,087	1,451,446	20.99	28,171
Aug.	31,204	12,860,150	18.39	2,377	1,084,646	20.37	28,827
Sept.	39,335	16,512,019	18.50	3,038	1,384,148	20.34	36,797
Oct.	44,058	18,200,332	18.44	2,405	1,085,407	20.15	41,653
Nov.	36,519	14,878,441	18.19	2,788	1,207,089	18.52	33,731
Dec.	43,511	17,580,966	18.04	2,738	1,165,743	19.00	40,773
1929:							
Jan.	57,564	22,872,943	17.74	3,663	1,773,401	21.61	53,901
Feb.	64,265	24,760,111	17.20	2,955	1,374,783	20.77	61,310
Mar.	50,604	20,380,905	17.98	4,218	2,094,037	22.16	46,386
Apr.	55,725	25,542,726	20.46	3,293	1,624,237	22.02	52,432
May	51,161	24,355,511	21.25	2,386	1,349,690	21.24	48,325
June	41,663	18,799,307	20.14	3,152	1,470,746	20.83	38,511
July	43,944	19,342,147	19.65	3,424	1,590,411	20.73	40,520
Aug.	37,222	16,530,090	19.83	2,644	1,232,217	20.80	34,578
Sept.	34,472	15,214,485	19.76	2,011	861,068	19.11	32,461
Oct.	38,163	16,192,261	18.94	2,614	1,190,510	20.33	35,549
Nov.	43,507	18,189,305	18.66	2,929	1,300,354	19.82	40,578
Dec.	42,952	17,573,330	18.27	2,745	1,007,279	16.38	40,207
1930:							
Jan.	47,496	17,793,563	16.72	3,144	1,077,415	15.30	44,352
Feb.	42,687	14,798,240	15.48	2,280	960,790	18.80	40,407
Mar.	44,976	14,653,243	14.54	3,187	1,192,708	16.71	41,789
Apr.	45,423	14,783,606	14.53	2,688	892,532	14.82	42,735
May	42,692	13,373,232	13.98	3,154	1,085,432	15.37	39,538
June	39,993	12,215,848	13.79	3,125	1,027,136	14.67	36,868
July	35,182	10,553,944	13.39	2,732	736,863	12.04	32,450
Aug.	35,713	9,666,362	12.08	2,194	646,667	13.16	33,519
Sept.	35,380	8,460,812	10.68	1,509	429,789	12.72	33,871
Oct.							
Nov.							
Dec.							

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)

Figures on Monthly Basis

	1923	1924	1925	1926	1927	1928	1929	1930
Jan.	30,106	29,058	29,638	32,196	31,518	34,403	43,002	36,669
Feb.	30,149	25,736	29,761	31,136	30,137	33,702	41,594	32,726
Mar.	36,629	28,385	33,498	32,936	36,141	35,688	44,730	35,914
Apr.	29,085	27,129	34,139	32,696	35,871	32,772	47,521	40,207
May	36,155	25,845	35,322	29,364	34,592	37,333	49,233	39,902
June	24,272	22,753	35,822	28,598	33,801	37,676	43,227	34,463
July	17,685	23,396	36,053	27,577	29,219	37,407	41,526	29,245
Aug.	20,359	28,982	35,909	34,533	33,460	42,927	38,274	30,575
Sept.	17,594	31,497	31,691	32,904	27,214	39,882	34,707	25,288
Oct.	21,321	31,520	29,047	29,836	26,790	40,857	34,800	
Nov.	20,437	27,289	28,853	28,080	26,792	37,461	27,659	
Dec.	31,902	27,199	28,748	26,293	25,492	31,232	23,531	
Totals	305,694	328,769	388,481	366,149	371,027	441,340	469,804	

Figures on Quarterly Basis

Quarter	1923	1924	1925	1926	1927	1928	1929	1930
Jan./Mar.	96,776	87,609	95,263	94,301	99,216	103,558	128,565	101,610
Apr./June	89,493	75,674	104,099	87,109	103,242	103,500	139,292	112,092
July/Sept.	55,621	83,813	99,493	93,793	89,210	117,573	113,746	
Oct./Dec.	63,617	92,656	85,789	83,212	80,860	117,597	84,872	
Totals	305,507	339,752	384,644	358,415	372,528	442,227	466,475	

Note—The Rubber Association estimates its monthly rubber consumption figures to be 90 per cent complete. Up until 1925 the quarterly figures were likewise estimated to be 90 per cent complete; beginning with 1925 an estimate of 92 per cent completeness has been used. These estimates have been used in raising the figures in this table to 100 per cent. The quarterly figures are generally regarded as the most authentic; the monthly figures may be accepted as preliminary.

U. S. Consumption of Gasoline

(In Barrels of 42 Gallons)

MONTHS	1929	1930	MONTHS	1929	1930
January	22,602,000	25,731,000	July	36,860,000	38,256,000
February	22,776,000	26,509,000	August	37,759,000	37,433,000
March	28,495,000	31,029,000	September	34,193,000	37,823,000
April	32,019,000	34,549,000	October	32,816,000	
May	34,117,000	36,497,000	November	31,502,000	
June	33,163,000	35,902,000	December	26,550,000	

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1928																																
June	19¾	19⅝	—	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	—	19½	—	19½	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19⅝	19	19	—	19½
July	—	18⅞	18⅞	—	19	19	—	20	20	—	19¾	—	19⅝	19½	19½	19⅝	19⅝	19⅝	19⅝	19¾	19⅝	19⅝	19¾	19¾	19¾	19⅝	19¾	19¾	19	19	19¾	19⅝
August	19½	19½	19¾	19¾	19	19¾	19⅞	20	—	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞	19⅞
September	—	—	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝
October	18⅝	18½	18½	18⅝	18⅝	18⅝	—	18⅝	18⅝	19	19	19	19	19	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛	19⅛
November	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	—	18⅝	18⅝	18¾	18¾	18¾	18¾	18¾	18¾	18¾	17⅞	17⅞	18	18	18	18	18	18	18	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞	17⅞
December	17⅞	—	17⅞	17⅞	17⅞	17⅞	18⅛	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
1929																																
January	—	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅝	18⅝	18⅝	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
February	22⅝	22	21⅞	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼	22¼
March	26	26	26	26	25⅝	25⅝	25⅝	25⅝	25⅝	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾	25¾
April	23	23¼	22⅝	22½	22½	22⅝	22⅝	22½	22½	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝
May	19⅝	19⅝	19⅝	19⅝	20¼	20¼	20¼	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
June	21⅛	20¾	21⅛	21⅛	21⅛	21⅛	21⅛	22	22	20¾	20½	20½	20½	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
July	21⅛	21¼	21	21¼	21¼	21¼	21¼	21¼	21¼	22	22	22	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾	21¾
Aug.	21⅝	21	21	21	21	21	21	21	21	20¾	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
Sept.	—	19⅞	19½	20¼	20¼	20¼	20¼	20¼	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½	20½
Oct.	19⅞	19½	19⅝	19⅝	19⅝	19⅝	20¼	20¼	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝	20⅝
Nov.	17¾	17¾	—	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾	17¾
Dec.	—	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼	16¼
1930																																
January	—	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾
February	15¾	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝	15⅝
March	15⅞	—	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½	15½
April	16½	16½	16½	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾	15¾
May	14⅞	14⅝	14⅝	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾	14¾
June	13¾	13¾	13¾	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞	13⅞
July	12¼	12¼	12	—	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½	10½
August	10⅞	10⅝	10⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝
September	9¾	9⅝	9⅝	9⅝	9⅝	9⅝	9⅝	8½	8½	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝	8⅝
October	7½	7½	8¼	8	—	7¾	8	—	8	8	8	—	7⅞	8	—	7⅞	8	—	8	8	—	8¼	8⅛	8⅛	8⅛	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞	7⅞
November	8¾	—	8⅝	—	8⅝	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1921

Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15
1911	141.30	1915	65.85	1919	48.70
1912	121.60	1916	72.50	1920	36.30
1913	82.04	1917	72.23	1921	16.36

Average Monthly Price per Pound Since 1922

Months	1922 Cents	1923 Cents	1924 Cents	1925 Cents	1926 Cents	1927 Cents	1928 Cents	1929 Cents	1930 Cents
Jan.	18.82	32.73	25.86	36.71	79.50	38.75	40.25	20.14	15.24
Feb.	16.12	35.14	25.29	36.01	62.25	38.25	32.75	23.97	15.85
Mar.	14.53	34.21	22.83	41.00	59.00	41.04	26.82	24.55	15.34
Apr.	15.99	32.48	22.51	43.64	51.25	40.86	18.97	21.18	14.93
May	15.25	27.39	18.89	58.47	47.75	40.76	18.99	21.46	14.24
June	15.11	26.88	18.81	77.26	42.50	37.25	19.59	20.64	12.45
July	14.67	26.10	22.16	103.16	41.03	34.87	19.40	21.30	11.24
Aug.	13.93	28.84	26.17	82.99	38.50	35.12	19.46	20.59	9.96
Sept.	14.44	28.95	27.56	88.88	41.00	33.67	18.47	20.37	8.28
Oct.	19.78	26.93	31.13	98.01	42.50	34.32	18.83	19.67	8.20
Nov.	23.88	27.14	34.33	104.80	38.50	37.58	18.26	16.62	—
Dec.	27.42	26.60	37.88	98.51	38.25	40.63	17.97	16.12	—
Average for Year	17.50	29.45	26.20	72.46	48.50	37.72	22.48	20.55	—

London Closing Prices of Ribbed Smoked Sheet

(In Pence Per Pound)

Day	Aug.	Sept.	Oct.	Nov.	Day	Aug.	Sept.	Oct.	Nov.
1	5⅛	—	3⅝	4⅞	17	—	4½	3⅞	—
2	5⅛	4¾	3⅝	—	18	4¾	4⅛	3⅞	—
3	—	4⅝	4	4⅛	19	4¾	4	—	—
4	5¼	4½	4	4⅛	20	4⅝	—	4	—
5	5	4½	—	4¼	21	4⅞	—	4⅛	—
6	5	4⅛	3⅞	—	22	4¾	3⅞	4	—
7	5	—	3⅞	—	23	4¾	3⅞	4⅛	—
8	5	4	4	—	24	—	3⅞	4¼	—
9	5	4⅛	4	—	25	4¾	3⅞	4⅜	—
10	—	4	3⅞	—	26	4⅝	3⅞	—	—
11	4⅞	4⅛	3⅞	—	27	4¾	3⅞	4¼	—
12	4¾	4⅛	—	—	28	4¾	—	4¼	—
13	4¾	4	3⅞	—	29	4¾	3¾	4⅜	—
14	4⅞	—	3⅞	—	30	—	3⅝	4⅜	—
15	5	4	3⅞	—	31	—	—	4⅜	—
16	4⅞	4⅛	3⅞	—					

Average Monthly Price Per Pound

Month	1928 Pence	1929 Pence	1930 Pence	Month	1928 Pence	1929 Pence	1930 Pence
Jan.	19.310	9.942	7.471	Aug.	9.300	10.505	4.880
Feb.	15.718	11.875	7.948	Sept.	8.530	10.160	4.075
Mar.	12.736	12.135	7.595	Oct.	8.807	9.620	4.023
Apr.	8.864	10.490	7.391	Nov.	8.596	8.442	—
May	8.845	10.717	6.926	Dec.	8.570	7.958	—
June	9.293	10.580	6.195	Average for Year	10.656	10.291	—
July	9.312	11.065	5.648				

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Day of Month	Oct.	Nov.	Day of Month	Oct.	Nov.	Day of Month	Oct.	Nov.
1	10.50	11.51	11	—	—	21	10.50	—
2	10.55	—	12	—	—	22	10.50	—
3	10.50	11.20	13	—	—	23	10.80	—
4	10.35	—	14	10.45	—	24	11.00	—
5	—	10.95	15	10.40	—	25	11.15	—
6	10.25	—	16	10.20	—	26	—	—
7	10.25	—	17	10.20	—	27	11.25	—
8	10.20	—	18	10.25	—	28	11.65	—
9	10.15	—	19	—	—	29	11.45	—
10	10.30	—	20	10.45	—	30	11.25	—
						31	11.20	—

Average Monthly Price Per Pound

Month	1928 Cents	1929 Cents	1930 Cents	Month	1928 Cents	1929 Cents	1930 Cents
Jan.	19.12	20.22	17.21	Aug.	19.28	18.62	12.03
Feb.	18.40	20.21	15.62	Sept.	18.67	18.83	10.85
Mar.	19.38	20.19	15.13	Oct.	19.62	18.46	10.63
Apr.	20.63	20.29	16.39	Nov.	19.84	17.53	—
May	21.58	19.41	16.43	Dec.	20.22	17.28	—
June	21.50	18.74	14.48	Average for Year	19.97	19.03	—
July	21.36	18.62	13.10				

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1928	ON HAND 1929	ON HAND 1930	AFLOAT 1928	AFLOAT 1929	AFLOAT 1930	ON HAND AND AFLOAT 1928	ON HAND AND AFLOAT 1929	ON HAND AND AFLOAT 1930
Jan.	110,244	76,342	126,068	46,441	93,330	65,483	156,685	169,672	191,551
Feb.	108,955	90,058	134,790	48,044	75,790	71,015	156,999	165,848	205,805
Mar.	114,061	100,536	141,843	43,378	67,065	63,646	157,439	167,601	205,489
Apr.	113,083	107,659	148,272	32,783	65,795	63,261	145,866	173,457	211,533
May	105,356	97,192	146,179	33,145	65,793	68,168	138,501	162,985	214,347
June	90,198	92,061	151,485	38,392	54,668	58,657	128,590	146,729	210,142
July	83,242	92,535	152,001	42,943	46,145	58,326	126,185	138,680	210,327
Aug.	68,994	90,769	158,178	54,904	49,423	61,168	123,898	140,192	219,346
Sept.	68,851	84,362	169,607	52,692	58,758	60,923	121,543	143,120	230,530
Oct.	66,421	88,483		45,646	59,180		112,067	147,663	
Nov.	61,956	92,219		75,502	62,358		137,458	154,577	
Dec.	66,166	118,609		92,037	62,388		158,203	180,997	

(Rubber Manufacturers' Association figures raised to 100%.)

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1928	1929	1930	At end of	1928	1929	1930
Jan.	66,524	25,191	60,434	July	35,429	30,080	31,048
Feb.	62,964	25,554	64,557	Aug.	32,084	35,605	
Mar.	58,272	28,214	68,923	Sept.	31,440	42,188	
Apr.	53,425	31,368	74,676	Oct.	24,207	47,803	
May	44,628	31,290	77,312	Nov.	17,775	52,454	
June	38,758	31,025	80,260	Dec.	19,815	54,304	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1930					
June	77,616	78,104	78,888	79,699	
July	80,060	80,501	80,814	80,845	
August	80,379	80,044	80,224	80,618	80,611
September	81,880	82,233	82,648	83,136	
October	81,544	82,245	83,102	82,218	
November	77,480				

Stocks in Liverpool

1930				
June	25,320	26,646	27,354	27,493	
July	28,143	28,226	28,126	28,381	
August	28,404	28,660	29,048	29,673	29,789
September	31,159	31,796	34,085	34,858	
October	36,378	37,244	37,211	38,345	
November	38,941				

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1928	1929	1930	End of	1928	1929	1930
Jan.	25,868	29,617	39,727	July	18,663	33,859	45,459
Feb.	22,867	32,373	44,371	Aug.	18,971	30,834	48,132
Mar.	20,538	29,437	45,657	Sept.	14,598	32,138	44,015
Apr.	16,946	26,474	48,478	Oct.	12,149	33,770	—
May	17,437	30,764	44,715	Nov.	29,188	30,963	—
June	18,207	30,403	42,451	Dec.	32,895	35,548	—

STOCKS IN OTHER CENTRES

1930 End of	Malaya Mainland	Afloat for Europe	Holland	Colombo	Para and Manaos
Jan.	44,740	28,440	2,134	5,400	3,668
Feb.	41,955	28,180	2,159	5,000	4,370
Mar.	39,206	27,510	2,220	4,759	4,578
Apr.	39,758	28,580	2,204	4,000	4,482
May	26,482	22,730	2,308	4,000	4,388
June	36,578	20,920	2,316	3,856	4,588
July	38,311	27,290	2,312	4,500	4,665
Aug.	39,482	30,310	2,916	5,200	4,489
Sept.		32,600		5,834	4,854

*Subject to revision.

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total	Per Cent Balloons		Total	Per Cent Balloons
1922	16,297,735	0.0	1926	24,199,524	78.8
1923	23,140,620	0.6	1927	19,700,003	79.1
1924	21,863,311	19.7	1928	24,247,282	81.6
1925	26,001,664	66.8	1929	24,141,502	80.3
1930			1930		
January	1,601,326	84.0	July	1,449,161	80.7
February	1,653,421	78.9	August	1,504,187	78.1
March	2,061,999	79.1	September	1,052,109	80.2
April	2,339,834	81.1	October		
May	2,010,067	84.3	November		
June	1,338,226	83.5	December		

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	40,932	45,259	51,633	60,845	61,237	64,439	77,944	73,303
Shipments	39,987	45,204	50,120	59,262	59,002	64,059	74,296	74,021
Inventory[2]	6,132	5,772	7,427	9,142	10,456	10,264	13,624	12,627

Figures for Recent Months

	PRODUCTION 1928	1929	1930	SHIPMENTS 1928	1929	1930	INVENTORY 1928	1929	1930
Jan.	5,358	6,722	4,745	5,394	6,626	4,701	9,949	13,712	12,719
Feb.	6,363	6,912	4,859	5,031	5,282	4,474	11,721	15,495	13,238
Mar.	6,819	7,519	5,188	5,731	6,708	5,032	12,389	16,351	13,469
Apr.	6,178	7,884	6,024	5,812	7,294	5,429	12,717	16,929	13,943
May	6,759	8,145	6,099	6,457	7,184	5,564	13,024	17,849	14,327
June	6,692	7,304	5,464	7,117	7,254	5,647	12,162	17,957	14,168
July	6,498	6,475	4,257	7,895	7,855	5,810	11,157	15,830	12,599
Aug.	7,469	5,806	4,443	8,403	7,845	5,520	10,034	14,226	11,571
Sept.	6,802	4,758	—	7,145	5,998	—	9,705	12,875	—
Oct.	7,326	4,919	—	5,717	4,960	—	11,520	12,845	—
Nov.	6,075	3,603	—	4,998	3,558	—	12,579	12,935	—
Dec.	5,605	3,261	—	4,591	3,346	—	13,624	12,627	—

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1922	1923	1924	1925	1926	1927	1928	1929
Production	50,850	60,116	70,706	82,614	76,618	70,823	80,180	78,417
Shipments	49,673	59,072	68,016	81,004	71,591	72,896	77,127	75,298
Inventory[2]	7,643	8,425	11,052	11,313	16,200	13,692	16,117	13,660

Figures for Recent Months

	PRODUCTION 1928	1929	1930	SHIPMENTS 1928	1929	1930	INVENTORY 1928	1929	1930
Jan.	5,441	6,517	4,914	6,072	7,242	5,181	12,982	15,386	13,551
Feb.	6,895	6,769	4,943	5,431	5,278	4,627	14,650	16,999	13,905
Mar.	6,231	7,466	5,271	5,731	6,737	5,042	15,573	17,750	14,057
Apr.	6,661	7,634	5,877	5,702	7,164	5,172	16,638	18,134	14,704
May	7,168	7,660	5,904	6,300	7,038	5,412	17,702	18,928	14,775
June	6,953	6,978	5,280	7,136	6,950	5,616	17,159	17,741	14,518
July	6,674	6,178	4,201	8,729	8,113	6,246	14,974	16,332	12,434
Aug.	8,343	5,846	5,116	9,350	8,183	6,146	13,931	14,157	11,452
Sept.	7,103	5,536	—	7,154	6,250	—	13,543	13,424	—
Oct.	6,929	5,310	—	5,662	5,001	—	15,285	13,656	—
Nov.	5,592	3,780	—	5,002	3,712	—	15,743	13,701	—
Dec.	5,184	3,716	—	4,858	3,631	—	16,117	13,660	—

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% representative or complete when issued and that basis has been accepted when preparing the statistics in this table.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	Passenger Cars	Trucks	Canada Total	Passenger Cars	Trucks	Grand Total
1923	4,020,255	3,631,728	388,527	146,438	129,228	17,210	4,166,693
1924	3,600,918	3,203,049	397,869	135,246	117,765	17,481	3,736,164
1925	4,265,704	3,760,459	505,245	161,389	139,311	22,078	4,427,093
1926	4,298,799	3,808,753	490,046	205,092	164,483	40,609	4,503,891
1927	3,393,887	2,938,868	453,019	179,426	146,870	32,556	3,573,313
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929							
Jan.	402,154	350,617	51,537	21,501	17,164	4,337	423,655
Feb.	466,084	407,589	58,495	31,287	25,584	5,703	497,371
March	584,738	513,266	69,559	40,621	32,833	7,788	625,354
April	620,656	538,679	81,977	41,901	34,392	7,509	662,557
May	603,969	516,055	86,596	31,559	25,129	6,430	635,528
June	545,252	453,956	91,296	21,492	16,511	4,981	566,744
July	500,331	427,213	73,118	17,461	13,600	3,861	517,792
Aug.	499,629	444,711	54,918	14,214	11,037	3,177	513,843
Sept.	415,332	365,651	49,681	13,817	10,710	3,107	429,149
Oct.	380,011	321,195	58,816	14,523	8,975	5,548	394,534
Nov.	217,570	170,928	46,642	9,424	7,137	2,287	226,994
Dec.	119,950	92,717	27,233	5,495	4,426	1,069	125,445
TOTAL	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930							
Jan.	273,089	235,099	37,990	10,388	8,856	1,532	283,477
Feb.	346,940	297,483	49,457	15,548	13,021	2,527	362,488
March	401,378	336,178	64,200	20,730	17,165	3,565	422,108
April	442,630	375,171	67,459	24,257	20,872	3,385	466,887
May	417,154	362,784	54,370	24,672	21,251	3,421	441,826
June	335,475	289,704	45,771	15,090	12,194	2,896	350,565
July	262,363	222,700	39,663	10,188	8,556	1,632	272,551
Aug.	223,046	187,288	35,758	9,792	6,946	2,846	232,838
Sept.	222,931	180,956	41,975	7,957	5,623	2,334	230,888
Oct.							
Nov.							
Dec.							

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA[1]							DUTCH EAST INDIES[5]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon[2]	India & Burma[3]	Sarawak[4]	British North Borneo[3]	Siam[4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China[3]	Amazon Valley	All Other[6]	World Total[7]
1923	252,016	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,955
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	517,528
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,208	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1928:															
July	30,481	13,383	17,098	5,129	1,043	905	593	366	5,602	7,566	11,594	698	1,264	873	52,731
Aug.	35,674	15,114	20,560	5,720	398	1,227	593	544	5,668	7,438	11,893	712	1,732	450	56,936
Sept.	29,769	11,239	18,530	4,675	457	938	594	447	4,956	6,536	9,863	969	1,614	494	50,078
Oct.	24,476	12,603	11,873	3,999	864	949	564	457	5,295	7,474	10,124	513	1,399	732	44,243
Nov.	68,135	10,436	57,699	8,005	1,048	772	564	425	4,950	7,902	7,805	943	1,790	623	92,526
Dec.	66,763	11,122	55,641	7,848	1,113	744	565	294	5,120	8,792	10,896	948	2,220	588	94,769
1929:															
Jan.	52,546	13,415	39,131	8,301	1,664	873	600	461	5,640	8,067	11,076	850	2,134	642	79,439
Feb.	47,926	12,103	35,823	7,064	1,117	955	600	495	6,572	7,511	10,384	807	2,104	520	73,952
Mar.	49,448	14,553	34,895	6,583	1,413	758	601	499	5,515	6,620	10,629	658	2,332	786	71,289
Apr.	49,816	11,414	38,402	5,097	727	747	548	306	5,997	6,645	11,321	673	1,950	569	72,982
May	43,960	15,593	28,367	5,723	800	966	548	453	6,264	6,961	13,437	1,059	1,922	733	67,233
June	40,398	14,344	26,054	5,563	1,122	1,061	547	422	5,582	6,693	11,270	757	1,398	548	61,017
July	46,454	15,071	31,383	5,457	974	1,247	641	462	6,422	7,192	13,995	875	1,457	543	70,348
Aug.	50,441	15,469	34,972	6,079	685	993	641	431	4,644	7,298	10,782	1,032	1,563	499	69,619
Sept.	53,484	12,392	41,092	7,993	384	832	640	406	4,708	7,517	10,149	655	1,566	504	76,446
Oct.	47,937	12,516	35,421	8,381	812	1,047	671	485	4,697	8,295	10,512	893	1,606	445	73,265
Nov.	46,279	11,204	35,075	6,660	1,065	668	672	278	4,760	6,711	9,380	771	1,442	535	68,017
Dec.	46,147	15,018	31,129	8,683	900	930	672	320	5,189	8,279	11,102	966	1,674	443	70,287
1930:															
Jan.	52,535	11,773	40,762	7,741	1,560	791	600*	386	5,709	7,831	8,920	856	1,837	585	77,578*
Feb.	48,947	12,960	35,987	7,825	1,245	847	600*	469	6,900	7,191	11,414	944	1,797	480	75,699*
Mar.	47,320	13,236	34,084	6,269	1,129	976	600*	391	5,796	6,612	11,070	643	1,674	536	69,780*
Apr.	45,517	16,331	29,186	5,030	856	1,026	600*	366	4,802	6,326	12,582	433	1,201	630	63,038*
May	49,388	36,135	13,253	5,947	975	917	600*	350	6,352	6,661	11,916	753	1,383	555	49,662*
June	36,657	12,120	24,537	4,152	778	1,040	500*	392	4,728	4,776	9,512	425	974	551	52,365
July	41,347	12,759	28,588	4,619	792	1,087	500*	327	6,022	5,891	9,770	648	810	418	59,472
Aug.	47,982	10,304	37,678	6,779	600	740	500*	335	5,982	7,197	9,520	394	809		
Sept.	48,529	8,087	40,442	7,920		680	400*	234	5,960	6,358	7,302	527	1,093		

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927 and 1,437 in 1928. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons 1924, 6 tons 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons 1924, 2,239 tons 1925, 44 tons in 1926, 84 tons in 1927, and 1,459 tons in 1928. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands. This figure includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. *Figure is provisional; final figure will be shown immediately it becomes available.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States[1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	236,977	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	342,378
1920	248,762	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	370,641
1921	179,678	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,562
1922	296,267	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	–3,807	1,778	589	567	395,885
1923	300,372	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	408,018
1924	317,747	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	–807	3,178	944	1,370	414,847
1925	381,815	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	516,491
1926	395,667	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	613,642
1927	398,483	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	627,789
1928	404,496	4,846	36,498	37,855	30,447	25,621	12,433	15.134	8,430	7,958	2,243	4,418	3,178	3,138	596,695
1929	526,709	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	892,739
1928:															
July	28,170	—1,374	3,518	3,387	2,692	2,026	1,598	724	591	895	395	294	175	384	43,475
Aug.	28,827	48	3,527	2,744	2,447	1,868	875	632	707	519	316	359	58	94	43,021
Sept.	36,800	4,199	3,524	3,553	2,812	1,837	1,278	20	603	597	345	377	277	235	56,457
Oct.	41,667	—934	3,728	4,386	2,943	3,711	1,049	98	766	696	141	527	250	318	59,346
Nov.	33,846	—3,141	3,278	3,694	2,799	2,150	1,340	689	837	544	31	337	252	282	46,938
Dec.	40,781	8,438	3,633	2,470	2,618	3,002	1,145	1,378	755	639	148	435	263	200	65,905
1929:															
Jan.	53,922	11,951	5,645	4,711	3,759	3,776	1,481	956	1,061	749	218	638	179	525	89,571
Feb.	61,331	5,179	5,001	4,613	2,908	2,727	1,259	684	1,131	627	113	226	115	356	86,270
Mar.	46,391	9,068	4,409	4,586	4,961	2,630	1,515	716	725	931	316	354	80	409	77,091
Apr.	52,447	8,295	4,854	5,351	3,177	2,308	1,407	703	1,518	750	144	956	40	445	82,395
May	48,350	5,112	3,152	3,682	2,937	2,314	1,417	996	1,437	854	201	468	37	277	71,284
June	38,676	4,787	6,814	3,948	3,075	1,593	1,624	695	2,215	672	687	507	24	520	65,737
July	40,914	4,993	4,839	3,559	3,205	2,388	2,023	1,056	2,918	1,039	253	519	30	465	68,201
Aug.	35,207	14,594	4,645	4,082	2,879	3,663	908	1,234	724	902	254	429	25	319	69,865
Sept.	32,171	17,010	3,889	4,691	1,908	3,511	1,224	1,235	853	672	253	361	91	477	68,346
Oct.	35,840	16,111	4,489	3,355	1,821	3,902	1,838	1,073	1,125	1,147	278	710	91	201	71,981
Nov.	40,972	13,141	3,082	3,776	2,709	3,221	1,275	1,226	1,453	361	253	595	62	313	72,439
Dec.	40,488	12,434	4,274	2,921	2,114	2,251	1,198	1,200	726	741	52	677	90	443	69,609
1930:															
Jan.	44,759	11,106	4,207	3,862	2,842	2,805	910	826	332	612	209	552	200*	577	73,799
Feb.	40,718	10,293	4,482	3,697	2,250	1,386	1,385	2,705	457	1,143	188	315	200*	239	69,458
Mar.	42,068	12,346	4,354	4,289	3,776	2,663	1,083	168	975	678	358	322	200*	263	73,543
Apr.	42,961	13,058	5,006	4,488	2,303	2,769	2,067	949	673	1,431	158	461	200*	255	76,735
May	40,287	9,861	5,233	4,379	2,593	2,699	1,279	1,677	64	1,250	230	274	200*	346	70,427
June	37,257	9,645	4,458	3,794	2,579	2,677	1,378	1,454	67	691	343	507	200*	282	65,332
July	32,692	7,650	3,311	3,449	3,347	1,206	197		84	939	172	756	200*		
Aug.	34,463	8,369	3,953	3,515	2,108	2,170	886		265	888	87	747	200*	342	
Sept.	34,273			4,089	1,578		1,279								

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]United States imports of guayule are not included in this compilation: such imports amount to 4,305 tons in 1926; to 5,010 tons in 1927; to 3,076 in 1928; and to 1,231 tons in 1929. *Figure is provisional; final figure will be shown immediately it becomes available.

Domestic Production of Miscellaneous Rubber Goods

	Rubber Proofed Fabrics	Rubber Heels	Rubber Soles	Mechanical Goods Shipments
	Yards	Pairs	Pairs	Dollars
1924	25,020,000	186,279,000	(1)	$48,615,000
1925	23,988,000	206,970,000	16,211,620(2)	64,877,000
1926	29,328,000	183,312,000	12,253,000	76,789,000
1927	37,872,000	201,014,000	27,160,000	68,625,000
1928	41,179,000	235,170,000	37,645,000	69,114,000
1929	50,731,000	232,126,000	34,499,000	74,770,000
1929:				
October	6,116,000	22,386,000	3,502,000	5,887,000
November	4,395,000	17,863,000	3,400,000	4,932,000
December	2,291,000	14,781,000	3,003,000	4,751,000
1930:				
January	3,281,000	15,470,000	3,496,000	5,169,000
February	3,441,000	14,172,000	2,338,000	5,376,000
March	3,570,000	15,439,000	2,582,000	5,981,000
April	4,029,000	17,762,000	2,593,000	5,989,000
May	3,597,000	15,603,000	1,939,000	6,163,000
June	3,379,000	15,795,000	2,734,000	5,318,000
July	2,940,000	15,117,000	2,663,000	4,910,000
August	3,458,000			4,552,000

(1) Not available; (2) Last 9 months only.

Source: "Survey of Current of Business of the Department of Commerce."

United States Imports of Guayule Rubber and Related Gums

(All quantities in Long Tons)

	Guayule		Balata		Jelutong		Gutta Percha	
	Tons	Dollars	Tons	Dollars	Tons	Dollars	Tons	Dollars
1919	1,430	760,690	727	937,038	8,332	2,213,964	2,900	1,068,698
1920	758	345,985	1,064	1,260,043	5,672	2,068,501	3,183	1,520,309
1921	58	26,945	814	1,077,859	1,745	351,893	985	333,564
1922	127	57,040	812	978,765	2,335	403,812	818	281,012
1923	1,155	542,227	700	898,524	4,565	853,308	912	375,167
1924	1,356	536,392	464	568,456	6,165	1,237,100	1,408	463,610
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	1,603	629,284
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	1,445	661,156
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,494	728,172
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	1,597	777,128
1929	1,231	545,175	728	566,964	8,203	2,458,126	447	167,479
1929:								
Sept.	107	51,156	38	30,327	913	279,225	—	—
Oct.	200	79,968	58	43,756	636	181,421	—	—
Nov.	125	47,796	13	11,600	583	182,677	49	14,935
Dec.	100	41,328	25	19,955	550	156,939	51	12,005
1930:								
Jan.	150	55,272	28	28,549	509	141,384	—	—
Feb.	75	25,956	52	45,319	367	93,087	—	—
Mar.	148	50,007	16	12,498	522	128,844	—	—
Apr.	75	19,856	58	54,548	410	103,089	—	—
May	172	57,760	17	13,645	602	144,415	—	—
June	168	51,561	52	47,000	532	120,424	45	16,649
July	93	26,000	24	17,463	45	102,325	—	—
Aug.	50	14,000	11	5,600	766	168,511	—	—
Sept.	100	28,000	45	39,512	486	86,664	1	1,711

Reclaimed Rubber in the United States

(All Quantities in Long Tons—100% Basis)

	Consumption					Consumption			
Year	Production	Tons	% to Crude	Stocks*	Year	Production	Tons	% to Crude	Stocks*
1920	86,395	75,297	38.4	.....	1925	132,930	137,105	35.6	13,203
1921	36,725	41,351	24.1	.....	1926	180,582	164,500	45.9	23,218
1922	57,834	54,458	19.3	.....	1927	189,144	178,471	47.6	24,980
1923	74,766	69,534	22.7	.....	1928	208,516	223,000	50.4	24,785
1924	80,079	76,072	22.4	.....	1929	218,954	226,588	48.4	27,464
1928:									
Jan.	14,862	20,140	58.5	21,941	July	17,278	19,070	51.0	17,305
Feb.	15,291	18,670	55.4	20,848	Aug.	19,049	17,890	41.7	15,881
Mar.	17,069	20,680	57.9	19,558	Sept.	18,693	17,795	44.6	17,991
Apr.	15,393	19,280	58.8	19,283	Oct.	17,182	18,420	45.1	17,026
May	18,945	20,215	54.1	18,137	Nov.	18,245	18,380	49.1	22,399
June	18,781	18,140	48.2	18,709	Dec.	17,728	14,320	45.9	24,785
1929:									
Jan.	18,685	21,068	49.1	24,394	July	18,387	20,236	48.7	19,679
Feb.	18,094	19,829	47.7	23,305	Aug.	19,787	18,230	47.6	22,309
Mar.	19,984	20,867	46.7	22,076	Sept.	18,660	17,071	49.2	24,984
Apr.	19,899	22,435	47.3	20,680	Oct.	18,865	18,744	53.8	26,117
May	20,385	23,176	47.1	19,479	Nov.	14,363	15,330	55.4	26,080
June	18,416	18,141	42.0	17,930	Dec.	13,429	11,531	49.0	27,464
1930:									
Jan.	15,010	17,454	47.6	24,241	July	12,322	12,384	42.3	23,873
Feb.	15,846	14,559	44.5	24,243	Aug.	12,047	10,985	35.9	22,980
Mar.	17,400	15,241	42.2	24,415	Sept.	11,433	10,480	41.4	21,996
Apr.	17,828	16,904	42.0	24,587	Oct.	.....	.....	.....	.....
May	17,812	17,052	42.7	23,356	Nov.	.....	.....	.....	.....
June	15,714	14,063	40.8	24,449	Dec.	.....	.....	.....	.....

*Stocks on hand at the end of month or year. Exports of reclaimed rubber, not shown in this table, amounted to 8,540 tons in 1927, 9,577 tons in 1928, and 12,369 tons in 1929.

REVIEW DESK

Books, New Publications, Catalogues, Etc.

CORONA PREVENTION AND OZONE ELIMINATION WITH RUBBER INSULATED WIRES AND CABLES. By E. W. Davis and G. J. Crowdes. Published by the Simplex Wire & Cable Company, 201 Devonshire Street, Boston, Mass. 1930. 20 pp. For free distribution.

At an early date experience seemed to indicate that the use of a rubber insulated cable for high voltage service was problematical if not impossible, the limiting factor entering into its successful operation being the formation of ozone and the consequent destruction of the insulation. After disposing briefly of the methods previously used to overcome this difficulty, the authors conclude that the only positive method of preventing rubber insulated cable failure due to ozone is to eliminate the ozone. This may be practicably accomplished, they find, by control of the electrostatic capacity of the rubber insulation through the specific inductive capacitance of the rubber compound. The voltage at which ozone forms can be calculated so as to design high voltage cables properly, and a formula for critical specific inductive capacity of an insulated cable is presented, together with an empirical formula for visual corona for plain wire. The immediate results from this application of theory have made possible the use of rubber insulated cables in fields heretofore considered impossible.

EFFECT OF ACCELERATORS ON PLASTICITY AND RATE OF SET-UP OF UNCURED STOCKS. Published by the Rubber Chemicals Section, E. I. du Pont de Nemours & Company, Wilmington, Del. 1930. 5 pp. For free distribution.

Most rubber chemists appreciate the fact that the tendency of an accelerator to cause scorching can not be predicted from its activity at vulcanizing temperatures. In other words, strong accelerators are not necessarily likely to cause scorching; in fact, the reverse is often the case. The tests described in this report are a series made with the standard Williams Plastometer, a method for determining the relative scorchability of rubber compounds which factory experience has proven reliable, and are said to constitute further proof of the tendencies of accelerators mentioned above.

THE UNITED KINGDOM: AN INDUSTRIAL, COMMERCIAL, AND FINANCIAL HANDBOOK. By Hugh Butler et al. Published by the United States Department of Commerce, Washington, D. C. 1930. 975 pp. $1.75.

As an effort to survey within the compass of a single volume the highly complex economic structure of one of the leading manufacturing and trading countries of the world, which is also the largest overseas market for American goods, this handbook has been admirably prepared and should serve valuably an important purpose. A 15-page chapter on "Rubber and Rubber Products" by Robert B. Macatee reviews briefly the crude rubber industry, crude rubber marketing procedure at London, the British manufacturing industry, production costs, exports and imports, and the services performed by industrial organizations and crude rubber trade associations. Other chapters deal with the automotive products, textile and other industries, with the labor problem, production costs in general, finance, marketing, advertising, tariffs, commercial laws and living conditions. A separate section is reserved for consideration of northern Ireland.

MAKING THE PLANT SAFE. Published by the Policyholders Service Bureau, Metropolitan Life Insurance Company, 1 Madison Avenue, New York City. 1930. 16 pp. For free distribution.

While activities designed to stimulate the interest of foremen and employes in accident prevention are usually considered fundamental in any industrial safety program, education and incentives to safe practice can not of themselves remove the hazards by lack of safe working conditions. Methods used by employers to provide safe working conditions in their plants are described in this report, the ninth of a series.

CONSERVING VISION IN INDUSTRY. Published by the National Society for the Prevention of Blindness, 370 Seventh Avenue, New York City. 1930. 32 pp. $0.25.

The work of this organization in preventing blindness in industry is well known. This pamphlet contains a transcript of the society's last annual conference, including several important talks on the conservation of vision in industrial work.